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# Managerial Judgement and Acquisition Target Valuation

By

Julian Andrews ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

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*"'Tis with our judgements as our watches, none*

*Go just alike, yet each believes his own."*

Alexander Pope, Essay on Criticism, 1711

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled *Managerial Judgement and Acquisition Target Valuation* submitted by Julian Andrews in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Organizational Analysis.

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# Abstract

## Managerial Judgement and Acquisition Target Valuation

Recent years have seen an increase in the number and value of mergers and acquisitions announced. However, research shows that the abnormal returns of these announcements are frequently negative or neutral for the acquiring firm. Negative abnormal returns indicate the acquiring firm overpaid for the target. Several reasons have been proposed why acquiring firms may over-value a target. In this dissertation I focus on the role of managers in the acquisition valuation decision process. Building from research in the strategic choice tradition and the behavioural decision theory literature, I investigate how managerial characteristics may influence target valuations. Specifically, I examine how the illusion of control may lead managers to base estimates of value on factors such as past performance and his or her industry familiarity. Using a sample of 135 acquisitions announced in 1994 and 1995 by and of publicly traded firms, I model the impact of the managers' prior performance, relative pay, target industry expertise and uncertainty on the premium bid. These models indicate that prior performance and industry expertise have a direct impact on the size of premia bid, as does one form of uncertainty. In addition, the level of uncertainty moderates the relationship between these independent variables and the premia bid. However, no evidence is found linking the size of premia and the post-announcement abnormal returns. The implications of these findings for acquiring firms, the study of acquisition behaviour and the study of managerial decision making in general are discussed.

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# CHAPTER 1: INTRODUCTION

Acquisitions are one of the most important resource investment decisions a company can make. Between 1976 and 1990 there were 35,000 acquisitions in the United States with a value of $2.6 trillion (Jensen, 1993). Recently the volume of merger and acquisition activity has increased. Since 1995 the United States has had three successive record years in terms of the number and value of deals, with11,209 mergers and acquisitions worth $908 billion reported in 1997 (Mergerstat Review, 1997).

Despite this continued increase in acquisition activity, there is considerable evidence that acquiring firms do not necessarily display improved performance. In fact, the empirical evidence of post-acquisition performance indicates that acquiring firms often display neutral or negative returns (Agrawal, Jaffe & Mandelker, 1992; Bradley, Desai & Kim, 1988; Dodd & Ruback, 1977; Morck, Shleifer & Vishny, 1990; Schmidt & Fowler, 1990; Sirower, 1997). A primary reason advanced for this negative impact on performance is that companies typically overpay for the acquisition (Barney, 1988). This is supported by the observation that shareholders often mark down the share price of the acquiring firm on announcement of a bid, indicating they believe that the acquirer paid too much for the target firm (Bradley et al., 1988; Morck et al., 1990; Shleifer & Vishny, 1991). This overpayment, or acquisition premium (defined as amount bid over the pre-bid value of the target), represents the return the acquiring firm estimates they can extract from the target, above and beyond that currently being earned. Empirical evidence indicates that these premia are associated with poor post-acquisition performance, suggesting that managers over-estimate their ability to extract value (Hayward & Hambrick, 1997; Roll, 1986; Sirower, 1997). Despite its impact on firm performance, the size and cause of acquisition premia has not been addressed extensively in the strategy literature.

### *1.1 Purpose of Research*

The purpose of this research is to investigate the factors that determine the premia firms are willing to pay to acquire other companies. This dissertation is based on the premise that an acquisition is a resource investment decision. As such, an acquisition bid represents a managerial judgement of the future value of a target firm's assets. Empirical evidence indicates that acquisitions are frequently associated with negative abnormal returns for stockholders, suggesting that these managerial judgements tend to be more optimistic than those of the market. The primary purpose of this research is to investigate why managers systematically over-estimate the value of a firm relative to the market and in doing so identify factors that may affect the quality of this judgement. A secondary purpose is to investigate the link between valuation judgements and subsequent firm performance. In order to do so, I will draw on extant literature on the sources of acquisition premia and apply behavioural decision theory to develop arguments about how the size of acquisition premia may be related to managerial and task characteristics. Specifically, I will address the questions of why managers consistently over-value targets, the circumstances under which managers may perform better or worse in valuing targets and the characteristics of managers that may lead to better or worse performance.

In conducting this research, I aim to contribute to the field's understanding of how acquisition premia arise and the factors that affect their size. This is a topic that has not received much attention in the strategy literature despite the prevalence of acquisition growth strategies and their direct connection with organizational performance. While recent research has begun to address this issue (Haunschild, 1994; Hayward & Hambrick, 1997; Sirower, 1997), considerable work remains to be done, especially in elaborating the role of individual managers. Such work is of interest not only to academics seeking to understand acquisition behaviour, but also to managers who are actively involved in acquiring other firms.

At a more general level, I aim to contribute to the strategic management field by providing further evidence of how managerial information processing, as reflected in managerial characteristics, may influence organizational performance, an issue that has not been addressed fully to date (Finkelstein & Hambrick, 1996; Meindl, Stubbart & Porac, 1994; Schneider & Angelmar, 1993; Schwenk, 1995; Walsh, 1995).

### *1.2 Thesis Overview*

This dissertation begins with a discussion of the relevant literature investigating acquisitions and their effect on firm performance. This review, conducted in Chapter 2, suggests that acquiring companies frequently pay too much for the target and suffer poor post-acquisition performance as a result. Most theoretical treatments of the cause of acquisition premia focus on efficiency explanations, arguing that the premium represents the extra value created by redistributing assets to higher value uses (Bradley & Jarrell, 1988). Takeovers represent a method of removing poorly performing managers or allowing potential synergies to be realized. Poor performance results from an inability by new management to fully realize these values. However, empirical evidence suggests that premia are not directly related to control (Dodd & Ruback, 1977). Synergy explanations also lack clear empirical support (Lubatkin, 1987; Slusky & Caves, 1991).

Two alternative explanations have been offered for the existence of acquisition premia. First, managers may over-value targets relative to shareholder returns because they are bidding for a private return (Morck et al., 1990). This logic is behind a considerable body of research in the finance and economics literature that focuses on agency explanations. For example, studies of executive compensation suggest that managers may seek to acquire other firms as a method of increasing their personal compensation (Fowler & Schmidt, 1988). However, studies of managerial shareholdings indicate that traditional barriers to agency behaviour (e.g. managerial shareholdings) do not eliminate premia (Slusky & Caves, 1991). Agency explanations are also limited in their explanation of the nature of a bid and are insufficient to account for the timing or level of a bid.

The second potential explanation for acquisition premia makes the distinction between the price paid for a target firm and the actual value. Since the price necessarily must represent an estimate of the value, it may be erroneous. Roll's (1986) hubris hypothesis is an example of this argument. Noting that economic justifications for acquisition premia were not well supported, Roll proposed that acquisition premia result from a form of 'winner's curse' in which the player with the highest positive valuation error wins the auction. However, the hubris hypothesis has been criticized for the assumption that all bids represent over-payment and its inability to explain variations in bid behaviour (Sirower, 1997). Other research in this field has focused on the valuation process, examining managerial factors that may systematically influence estimates of target value (Haunschild, 1994).

The primary thesis of this dissertation is that acquisition premia are an acquiring company's forecast of the future value of the target and accordingly are prone to error.

Therefore, factors that influence these forecasts will have direct implications for organizational performance. In the remainder of Chapter 2 and Chapter 3 I focus on how managerial information processing may systematically distort valuations.

I use a strategic choice approach (Child, 1972) to understand acquisition valuations. Strategic choice provides an explanation of why managers frequently over-value potential targets. In such an approach acquisition valuations do not represent a perfectly rational economic calculation of benefit but are imperfect judgements subject to the cognitive limitations and motivational orientations of senior management. While the motivations of managers have been studied at length in the literature (Fowler & Schmidt, 1988; Morck et al., 1990; Shleifer & Vishny, 1989; Slusky & Caves, 1991), there has been very little research devoted to the potential cognitive explanations for premia. The scant literature studying acquisition premia in the strategy field has focused on individual characteristics such as hubris (Hayward & Hambrick, 1997) and organizational factors such as interlocking board holdings (Haunschild, 1994). Other research has shown that factors such as experience, education and functional training, all explicitly proxying for knowledge, are related to acquisition target valuations in experimental tasks (Hitt & Tyler, 1991; Stahl & Zimmerer, 1984). These effects, although not large, suggest that managerial information processing may be an important factor in acquisition behaviour.

In Chapter 3, I introduce behavioural decision theory to discuss how managerial information processing may be related to acquisition premia. Viewing the acquisition valuation problem as a decision made under uncertainty emphasizes the importance of judgements of the probability of achieving certain levels of return.

As a resource investment decision, valuing a target firm essentially consists of estimating the probability of future cash flows. Behavioural decision research has identified the existence of a systematic planning bias in which subjects are overly optimistic when estimating outcomes (Kahneman & Tversky, 1979). This bias occurs because of the use of decision heuristics in the forecasting process (Dawes, 1988; Kahneman & Tversky, 1979). As an acquisition involves the purchase of control over a target firm, a bias that has been suggested as particularly relevant to acquisition valuation is the illusion of control (Schwenk, 1984, 1988).

The illusion of control refers to an exaggerated belief in the importance of one's actions in determining outcomes (Langer, 1975). As such, estimates of future outcomes are often based on estimates of one's perceived competence in the task (Heath & Tversky, 1991; Howell & Burnett, 1978). The illusion of control is widespread amongst managers (MacCrimmon & Wehrung, 1986: March & Shapira, 1987). This suggests that managerial forecasts of future performance will be based on a manager's perceived competence, even when outcomes are largely beyond the manager's control (Duhaime & Schwenk, 1985). Therefore, I speculate that measures of perceived competence will be related to acquisition bidding behaviour. Two factors that have been demonstrated to be linked to perceived competence in forecasting tasks are performance feedback and relevant knowledge (Johnson, 1988; Mahajan, 1992; Spence & Brucks, 1997; Yates, McDaniel & Brown, 1991). Hence, I argue that these measures are positively related to estimates of acquisition target value. In addition, I propose that a manager's general self-confidence will be positively related to these estimates.

Another issue that must be addressed by an explanation of the link between managerial judgement and acquisition behaviour is why target valuations reflect individual judgements. Studies of strategic decision processes indicate that the level of uncertainty faced determines the extent to which individual judgement is relied on in organizational decision making (Dean & Sharfman, 1993; Leblebici & Salancik, 1981). When uncertainty is high individual judgement becomes more important (Thompson & Tuden, 1959), leading to greater use of cognitive simplification devices such as heuristics (Schwenk, 1988). Therefore, it is argued that individual judgement will be more prevalent and decision biases more pronounced when uncertainty is high.

The behavioural view of acquisition valuation provides a strategic choice interpretation of acquisition valuation that differs from the hubris hypothesis in two important respects. First, the relevant managerial characteristic is perceived competence, not hubris. Perceived competence is not a static personality trait but is task specific. This provides a more flexible understanding of how managers value different targets. Second, addressing the reasons managerial characteristics influence judgements incorporates the nature of the task faced, thereby focusing on contextual factors such as level of uncertainty.

Chapter 4 describes the method by which I test empirically the hypotheses developed in Chapter 3. The study is designed in two parts. In the first part, a correlational design is used to test factors that influence the size of acquisition premia. The sample comprised 135 acquisition announcements made in 1994 and 1995 in which both parties were public companies listed on one of the three major U.S. exchanges. This sample was examined to determine the influences on the price an acquiror is willing to pay. Data on the nature of both the acquiring and target firms and the senior managers of the acquirors was obtained from the Center for Research in Stock Prices (CRSP) database, Standard & Poor's Compustat database, the Mergerstat Review and Dun & Bradstreet's and Standard & Poor's executive directories (1993, 1994). In the second part, an event study design was used to test the impact of an acquisition announcement on the subsequent performance of acquiring firms in the sample. Using performance parameters derived from historical stock performance data obtained from the CRSP database, I measured the impact of the characteristics of the acquisition on abnormal returns to the acquiring firm.

The results of these empirical tests are presented in Chapter 5. Estimation of regression models indicates that both the prior performance of the acquiring firm and the expertise of the acquiring CEO in the target industry were positively related to the size of the acquisition premium. These results support the hypotheses developed in Chapter 3. They suggest that the estimates of future value implicit in an acquisition bid are based, in part, on factors other than the economic characteristics of the target firm. Further analysis of these relationships indicate they are moderated by the level of uncertainty in the target firm's primary industry. Consistent with the arguments made in Chapter 3, managerial expertise and past performance were more important in determining premia when uncertainty was higher. This led firms to bid more for targets when technological uncertainty was greater, although a similar effect was not identified for commercial uncertainty.

The second series of tests examined the performance implications of acquisition behaviour. The current sample was consistent with the majority of previous research in showing that average abnormal returns to acquiring firms are negative. This finding supports the assertion that the price bid includes an error component in the estimate of future value and that this error is systematically biased upwards. However, the data did not show a relationship between the size of the premium and subsequent performance. This suggests that the size of the valuation error was independent of the size of the premium. Further post-hoc analysis indicated that the error was greater when the valuation was based on perceived competence.

Chapter 6 reviews the theoretical and empirical contributions of this research. The findings contribute to the large body of literature showing that, on average, acquisitions are value-destroying and the majority of acquiring firms lose value on the announcement of an acquisition. The results are also predominantly consistent with research on the sources of acquisition premia and contribute to the field by supporting the framework used to understand the link between managers and pricing decisions. This framework is more flexible than existing theory and has greater predictive utility.

Several implications of the research are then discussed. The findings suggest that research directed at the target valuation process may add to the field's understanding of acquisition pricing and post-acquisition returns. In particular, the role of judgement appears important. The findings also may be used to further develop cognitive concepts of related acquisition behaviour such as Prahalad and Bettis' (1986) dominant management logic.

At a more general level, the study demonstrates the importance of managerial decision processes in acquisition behaviour and suggests how it may be related to firm performance. The results may also shed light on distortions in other resource investment decisions such as product development or system implementations. In addition, the findings focus attention on how the study of systematic biases may provide predictive theory for economic behaviour in market contexts (Camerer, 1987).

By demonstrating that judgement processes alter valuations of target firms, this study is also valuable to practicing managers. Methods of minimizing the impact of systematic judgement biases are discussed.

The dissertation concludes with a discussion of the limitations of the study and directions for future research.

# CHAPTER 2: ACQUISITION ACTIVITY AND ORGANIZATIONAL PERFORMANCE

In this chapter I review existing research on the issues of acquisition performance and the source of acquisition premia. This literature suggests that the performance implications of acquisitions are frequently negative. Immediate negative market responses to announcements of acquisitions imply that the price offered for the target is too high. This has led scholars to examine the sources of pricing decisions and acquisition premia. The majority of this research has focused on poor management, synergy or agency as the motives for the payment of a premium. One recent explanation for over-payment that has received some empirical support is that individual managers' cognitive processes may systematically distort the valuation processes. This explanation focuses attention on the cognitive processes of top management, is consistent with work on strategic choice in other areas of strategy research and appears to be a promising direction for further research.

## *2.1 Acquisition and Firm Performance*

The 1990s have seen a surge in the popularity of acquisitions as a method of resource investment. In 1997 over $900 billion worth of mergers and acquisitions were announced. However, the benefits of this activity to the acquiring firm have been disputed. While some studies have demonstrated that acquisitions may improve firm performance, the weight of evidence suggests that they may have neutral or negative effects on performance (Bradley et al., 1988; Jensen & Ruback, 1983; Morck et al., 1990; Roll, 1986, 1988).

In an extensive review of studies of reactions to acquisition announcements, Jensen and Ruback (1983) examined returns to acquiring firms and concluded that "bidding firm shareholders do not lose" (p.47). However, evidence shows that bidding firms do not benefit to the same extent as target firms. Bidding firms had weighted average abnormal returns for the announcement period of 3.8% for successful bidders and -1.1% for unsuccessful bidders, whereas target firms had weighted average abnormal returns of 29.1% and 35.1% for successful and unsuccessful bids respectively (Jensen & Ruback, 1983, Table 3).

The studies reviewed by Jensen and Ruback (1983) were conducted on samples drawn from the 1960s and 1970s. Subsequent research based on acquisitions in the 1980s suggests that returns to bidding shareholders are often negative. For example, Bradley et al. (1988) report that the average abnormal returns for an eleven day period around the announcement of 52 acquisitions between 1981 and 1984 was -2.9% and 65% of acquirers experienced negative returns. Morck et al. (1990) also found negative returns on the announcement of bids, although the average abnormal return of -1.8% was not significant. However, they did find that 63% of firms showed negative returns, a figure that was significant. Sirower (1997) reported average acquiror abnormal returns of -2.3% in a sample of 168 bid announcements. Again, 65% of firms experienced negative results. Other studies (Byrd & Hickman, 1992; Jennings & Mazzeo, 1991) provide substantially similar results.

The studies described above focused on short-term results around the announcement date, however the results are robust to longer periods of performance. Of the studies reviewed by Jensen and Ruback (1983), seven examined abnormal returns for the year following acquisition. In these studies the abnormal returns averaged –5.5%. Both

Dodd and Ruback (1977) and Bradley et al. (1988) report negative abnormal returns for bidding firms in tender offers in the twelve months following the bid. Longer periods also show the same pattern. In a study of 55 industrial manufacturing firm acquisitions in the mid-1970s, Fowler and Schmidt (1989) found that accounting and investor returns for acquiring firms were negative in the four years after acquisition compared to the four years before. Using a sample of almost all tender offers made by NYSE acquirors from 1955 to 1987, Agrawal et al. (1992) found that bidding firms earn a statistically significant loss of about 10% during the five year post-acquisition period.

There is some evidence that acquisition can generate shareholder value in the bidding company. Lubatkin (1987) reports evidence that the stock returns to 439 acquiring firms in 1031 mergers were positive. However, the positive effects occur prior to the transaction date. Post-acquisition abnormal returns are not significantly different from zero. Jarrell, Brickley and Netter (1988) examined 663 successful tender offers between 1962 and 1985. On average, bidding firms showed a slight positive excess return of 2.04% over the 30 days around the announcement. However, their data showed that acquisitions in the 1960s were more profitable (abnormal returns of 4.95%) than acquisitions in the 1980s, which showed an insignificant decrease in excess returns (-0.04%). These findings are consistent with Bradley et al. (1988) who also reported declining returns for acquirors between 1960s and the 1980s.

Taken overall, the available literature supports the assertion that returns to bidding firms are at best slightly positive or neutral and are frequently negative (Scherer, 1988). In the following section I address the question of why acquisitions frequently lead to negative returns for the acquiror.

## *2.2 The Causes of Poor Acquisition Performance*

The value of a target firm (B) to an acquiror (A) is determined by the increase in value of the combined firm's assets over those of the acquiror alone, as shown in Equation 2.1 (Barney, 1988).

$$\text{Target value} = \text{NPV}(A + B) - \text{NPV}(A) \qquad [2.1]$$

When the price paid for the target is equal to its economic value, the acquiring firm will earn normal profits and abnormal returns will be zero. When the price paid is less than the economic value, the acquiror may earn positive abnormal returns. Negative abnormal returns "will occur when bidding firms over-estimate the value of targets, and thus the price paid for a target will be greater than the economic value that a target brings to the bidding firm" (Barney, 1988; p.77). Therefore, the prevalence of negative abnormal returns noted in the literature occurs when the value extracted from the target is less than the price paid.

The price paid for a target typically comprises the current market value of the target plus a premium (Equation 2.2). As the price reflects the "discounted value of the expected post-merger earnings" (Lubatkin, 1987: p.40), this premium equals the increase in value of the combined assets over each in isolation (Equation 2.3). In other words, acquisition premia represent the return an acquiring firm estimates they can extract from the target, in excess of the return currently being earned.

$$\text{Price} = \text{NPV}(B) + \text{premium} \qquad [2.2]$$

$$\text{Premium} = \text{NPV}(A + B) - \text{NPV}(A) - \text{NPV}(B) \qquad [2.3]$$

Acquisition premia are often very large. Jensen (1993) reports that between 1976 and 1990 the average premium paid for acquisitions in the U.S. was 41%, indicating that, on average, acquiring firms valued targets at 1.41 times their market value prior to the bid. This premium is a statement of the increase in value of the combined assets over each in isolation. Negative returns result when the price paid exceeds the value extracted. Indeed, empirical research has linked directly the size of premium paid with subsequent negative abnormal returns (Hayward & Hambrick, 1997; Sirower, 1997). Therefore, any treatment of abnormal post-acquisition performance must necessarily address the determinants of acquisition premia and, hence, the question of why firms seem to systematically over-estimate the economic value that targets bring to the acquiror.

The majority of existing literature assumes the price paid for the target (and therefore the premium) is a fair assessment of its true value, and poor post-acquisition performance occurs because of an inability to realize that value (Trautwein, 1990). This research is discussed further in Section 2.2.1. Alternative explanations stem from the assumption that price may not equal value (Trautwein, 1990). In these explanations, research is focused on factors that may lead to systematic distortions in bid prices. Agency explanations focus on the distinction between shareholder and managerial value, whereas strategic choice explanations focus on the valuation process. These different approaches are summarized in Table 2.1.

| Approach | Motivation for Acquisition | Source of Premia (price) | Reason for Poor Performance | Evidence |
|---|---|---|---|---|
| 1. Economic:<br>a. Synergy | Economies arising from combination of assets | Value of economies of combination | Inability to effectively realize economies | • Synergy most oft-cited motivation<br>• Inconclusive evidence that synergies lead to increases in value<br>• Occurrence of synergies are likely over-estimated |
| b. Inefficient Management | More effective management of target assets | Increase in value due to full utilization of target assets | Inability to manage target assets more effectively | • Mixed evidence that it may motivate takeovers<br>• Little evidence that change in management improves performance |
| 2. Agency | To obtain managerial perquisites (e.g. security, compensation) | Value to shareholder plus value to management | Wealth transfer from acquiror to target in return for managerial benefits | • Some evidence agency may motivate takeover bids<br>• Incomplete explanation of takeover behaviour |
| 3. Managerial Valuation | Potential synergies or management improvements | Estimates of value due to synergies or management improvements | Estimates of value over-state benefits | • Evidence that cognitive and social factors influence valuation judgements<br>• Little empirical research<br>• Consistent with evidence from other areas of strategy |

Table 2.1 : General Approaches To Understanding Poor Post-Acquisition Performance

### 2.2.1 Economic Explanations

Classical economic theory argues that acquisitions represent a market for corporate control. This market allows a more efficient distribution of assets and channels them to higher value uses, thereby creating value (Bradley & Jarrell, 1988). This approach has generally been interpreted in two ways. First, acquisitions represent a method of disciplining poorly performing managers by removing them from control of target company assets; a net gain results as target assets are more efficiently managed. The second manifestation of a classical economic approach is that acquisitions occur because of the extra value created by combining target and bidding firm assets, beyond that created by each in isolation. These synergies arise from more effective utilization of firm assets (Slusky & Caves, 1991), such as technical, pecuniary or portfolio economies (Lubatkin, 1983).

In these approaches poor post-acquisition returns occur because the acquiror is unable to extract the full value of the target. That is, the neutral or negative abnormal returns result from an inability to manage the acquisition process. For example, Lubatkin (1987: p.48) ascribes the lack of post-acquisition positive returns to "post-acquisition issues of organizational fit and the process of 'managing the consolidation.'" Much of this work has focused on post-acquisition events such as losing key management personnel (e.g. Cannella & Hambrick, 1993; Walsh & Ellwood, 1991) and ineffective integration (e.g. Datta, 1991) which leads to an inability to realize potential synergies.

However, there is considerable evidence that bids may overstate the post-acquisition increase in value that may occur because of prior management under-utilization of assets or potential synergies. For example, there is some evidence that not all target firms perform poorly prior to a bid (e.g. Ravenscraft & Scherer, 1988; Walsh & Ellwood, 1991). Further, Dodd & Ruback (1977) report that 'cleanup' bids in which the acquiror already has control and seeks to obtain the remaining shares show very similar performance effects as bids where no control is held prior to the bid. Ravenscraft and

Scherer (1987) sought to test the inefficient management hypothesis directly. Using line of business data they demonstrated that, prior to a bid, business lines subjected to tender offers performed below the average performance of comparable lines. This result is consistent with poor management being a motive for acquisitions. However, the newly acquired lines of business continued to perform at below average levels for an average of nine years after the acquisition. Thus, performance does not significantly improve nor deteriorate after acquisition.

A synergy explanation has intuitive appeal and is often the explanation cited by managers for acquiring other firms. In a series of structured interviews with 32 senior and experienced merger and acquisition professionals, Walter and Barney (1990) found that the existence of potential synergies was the primary reason cited for undertaking acquisitions. However, closer examination of the source of potential synergies suggests they may be rare. Abnormal returns can only be generated from synergistic cash flows in two ways (Barney, 1988). First, the cash flows must be uniquely valuable and either private or unique to the particular combination of firms. Failing this, other firms in the market will bid up the price to include these synergies. In such cases, the target firm's market price would include the value of these synergies and any premium represents over-payment. Therefore, these values can only accrue to a particular combination of target and bidder. However, the empirical evidence described above is consistent in showing that target shareholders receive the large majority of wealth created (Jensen & Ruback, 1983). In disputing synergy explanations Roll (1988) asks why wealth is not shared more evenly if both firms are required to create value. Second, synergistic cash flows may lead to abnormal returns if they are unexpected. Hence, acquisition premia must be *estimates* of future, unknowable synergies (Sirower, 1997).

In addition, the large body of literature on diversification strategies has been unable to show conclusively that related acquisitions, in which synergies are presumed to exist, create more value than those with no presumed synergies (Lubatkin, 1987; Rumelt, 1974; Walsh & Seward, 1990). More detailed measures of synergy demonstrate that financial synergies may influence bidder performance (e.g. Chatterjee, 1986; Slusky & Caves, 1991), although Seth (1990) found no evidence of financial diversification as a source of value. Managerial and operational synergies have not received empirical support (Slusky & Caves, 1991).

The review conducted in this section suggests that poor post-acquisition performance is not due solely to post-acquisition events. The value of the acquisition is less than the price paid not because managers are unable to extract the full value from target assets but because the value reflected in the price was over-stated.

### 2.2.2 Agency Explanations

In the approaches described above it is assumed that price exceeds value because managers are not perfectly effective at extracting value. Slusky and Caves (1991) note that the discrepancy between price and value may occur if managers are not acting to maximize shareholder value. Instead, managers may act to maximize personal utility. Hence, another explanation offered for takeover activity is managerial self-interest (Morck et al., 1990). Poor post-acquisition performance occurs because the price paid for the target exceeds its value to the shareholders. It is argued that managers choose to acquire other firms for motives other than the financial returns to shareholders. For example, executives in large firms are often better paid, therefore managers may be motivated to increase firm size through acquisitions in an attempt to increase their overall compensation. There is empirical evidence that managers of acquiring firms do receive increased compensation (Schmidt & Fowler, 1990). There is also evidence that managers acquire companies in which their skills are valuable, thereby increasing the firm's dependence on them and enhancing their job security (Shleifer & Vishny, 1989). However, Lambert, Larcker & Weigelt (1991) find that the relationship between changes in organizational size and executive compensation, although significant, is very small. This suggests that acquisitions are an ineffective way to secure increases in compensation.

The weakness in this argument is the inability to explain the size of acquisition premia (Roll, 1988). Self-interest may motivate the decision to acquire, but it is not informative with respect to the nature of the bid. Management may achieve their personal goals by acquiring the firm, the price at which it is acquired is less important. Accordingly, one would expect minimal premia to be paid in uncontested acquisitions, particularly when management and owner interests are closely aligned in other respects. Data reported by Slusky and Caves (1991) indicates that managers with larger holdings in acquiring firms bid less for acquisitions when the bid was uncontested. However, the acquisition bids were still considerably larger than market valuations. Further, the existence of premia is a robust phenomena of acquisition activity (Jensen, 1993). Clearly, although managerial self-interest may be a motivating factor in acquisition strategies, there are several other factors that influence the price paid for a target.

### 2.2.3 Managerial Valuation Explanation

An alternative approach to understanding post-acquisition performance arises from the distinction between merger decisions as rational choice and merger decisions as process outcomes (Trautwein, 1990). Economic approaches assume the price bid is a rational calculation of future value. For example, Lubatkin (1987: p.40) assumes that "buying firms on average are managed by rational decision makers who pursue mergers as a means to improve the wealth position of their firm's stockholders." Agency explanations also assume a rational decision maker maximizing value, although they differ in to whom the value accrues. A managerial valuation approach views acquisition decisions as similar to other strategic choices in that they are made by individual managers. As such, price decisions are not necessarily fully rational. The price bid represents *managerial judgements* of the value of the target to the company. Managers are intendedly rational and still look to factors such as synergy as sources of value. However, these estimates of value do not always equal true economic value. To return to Equation 2.3, the premium is equal to the expected increase in value of the combined assets over each in isolation. The managerial valuation approach focuses on the fact that this premium is an estimate of value and will contain an element of error, as described below:

$$\text{Premium} = \text{NPV}(A + B) - \text{NPV}(A) - \text{NPV}(B) + \text{error} \qquad [2.4]$$

The prevalence of negative abnormal returns for acquiring firms evident in the literature described above suggests this error is systematically biased upwards. That is, individual firms systematically value targets higher than investors do. Therefore, in order to understand acquisition premia and acquiring firm performance, one must investigate why managers have more optimistic estimates of target values than the market.

Roll's (1986) hubris hypothesis is an example of this approach. Roll argued that over-payment is a form of the 'winner's curse.' As the acquisition bidding process is similar to an auction, the manager with the highest positive valuation error will 'win.'

However, the over-valuation error leads to over-payment and subsequent negative abnormal returns. Roll stated that the valuation error results from a manager's hubris, or inflated self-confidence, that leads him or her to over-estimate the value he or she can extract from the target. Empirical validation of this hypothesis found that various measures of confidence were related to the size of acquisition premium paid and subsequent performance. Hayward and Hambrick (1997) used archival data from 106 acquisitions in 1989 and 1992 involving publicly traded companies to determine if CEO self-confidence is related to acquisition premia. The authors noted that Roll does not define hubris, so instead they drew on a dictionary definition and state that "its essential element is extreme confidence" (p.106). CEO self-confidence was assessed using measures of recent organizational success, media praise for the CEO and the CEO's compensation relative to other executives in the firm. Results indicated positive relationships between the measure of self-confidence and acquisition premium paid, acquisition premia and shareholder losses and CEO self-confidence and shareholder losses. The authors cited the results as strong support for the impact of the personality trait hubris on acquisition bids, stating that "hubris infects extremely confident managers who highly estimate their ability to extract acquisition benefits and consequently pay large premiums" (1997: p.106).

Similarly, Sirower (1997) argued that poor performance results from an over-estimation of the benefits of acquisition, rather than an inability to realize them. In particular, Sirower focused on over-estimations of synergistic benefits, which lead to an over-statement of price. He argued that limits exist to the amount of synergy that may be realized and that large acquisition premia necessitate difficult performance targets to achieve the required return on resources. He supported these arguments with an empirical analysis of 168 large acquisitions.

Other researchers have also begun to address the question of what non-economic factors influence managerial judgements of value in potential mergers. Haunschild (1994) investigated non-economic characteristics of acquisitions and found that factors including interlocking board directorates and the premia paid by other clients of the acquiror's investment banker were related to acquisition premia paid. This suggests that managers were using other acquisition bids as anchors to their own judgements. Other researchers have shown the impact of individual managerial characteristics on valuations of hypothetical target firms (Hitt & Tyler, 1991; Stahl & Zimmerer, 1984).

The evidence offered by Hayward and Hambrick (1997) and Sirower (1997) supports the proposition that the price paid for target firms frequently is based on overly optimistic estimates of the potential benefits of the merger. However, current theory is under-developed in addressing the causes of this overly optimistic forecasting. Roll's hubris hypothesis is limited in its ability to explain variations in acquisition behaviour. As it rests on an assumption of an efficient capital market, it is assumed that all acquirors over-pay, with the only question being by how much. This over-payment is in direct relationship to the arrogance of the manager. The proposed relationship between confidence and over-payment becomes almost tautological, as all premia represent over-confidence and are caused by over-confidence. As a result, the hubris hypothesis cannot explain why average acquisition premia are increasing over time (Sirower, 1997) nor why some acquisitions with large premia prove to be successful. Most damagingly, Roll does not provide a theoretical argument for why hubris influences judgements of value in an organizational context.

In this dissertation I draw on behavioural decision theory to develop an understanding of the factors that influence managerial judgement of value in acquisition targets. In particular, I will examine how managers' cognitive processes influence acquisition pricing decisions and thus post-acquisition performance. A large body of literature in the strategy field has demonstrated the impact of managerial information processing, both directly and through proxy measures, on many judgements significant to organizational strategy.

### *2.3 Strategy Formulation Process*

In recent times the strategy formulation process has received increasing interest in strategic management research (Huff & Reger, 1987; Rajagopalan, Rasheed & Datta, 1993). This literature argues that policy formulation is primarily a decision making task (Cyert & March, 1963; March & Simon, 1958). Strategy may be described as the process of matching organizational resources to environmental threats and opportunities in such a way as to create sustained superior performance. As executive judgement guides these strategic choices, managerial cognitive processes are a key productive resource and an important source of competitive advantage for companies (Amit & Schoemaker, 1993; Penrose, 1959; Priem, 1994). However, a strategic choice approach argues that a purely rational view of how these decisions are made is incomplete. Rather, decisions are subject to the cognitive limitations and motivational orientations of the individuals making them (Child, 1972). These arguments underlie the increasing body of literature that investigates the role of managerial cognition in strategic management (e.g. Barr, Stimpert & Huff, 1992; Bukszar & Connolly, 1988; Duhaime & Schwenk, 1985; Hambrick & Mason, 1984; Schwenk, 1984, 1986, 1988, 1995; Walsh, 1995). Building from Simon's (1976) notion of bounded rationality, the cognitive perspective in strategic management has explored the implications of managerial information processing for policy formulation.

Due to the difficulty of measuring cognitive processes, empirical research has not matched the level of speculation and interest evident in the literature. In order to address this issue, many scholars have followed an indirect approach, proposing that, as individual characteristics effect the cognitive bases of managers (Schwenk, 1984), demographic variables could be used to infer cognitive variables (Hambrick & Mason, 1984). Most research has followed Hambrick and Mason's suggestion that one need not examine the 'black box of cognition.' These authors' upper echelon theory proposes that, as cognitive base and values are derived from experience, factors such as education, functional experience and organizational tenure serve as adequate measurable proxies for them. Therefore, it is sufficient to relate individual characteristics to organizational outcomes. Factors commonly measured include age (e.g. Hitt & Barr, 1989; Ireland, Hitt, Bettis & DePorras, 1987), educational background (e.g. Hitt & Tyler, 1991; Wiersema & Bantel, 1992) and experience (e.g. Fredrickson, 1985; Hitt & Barr, 1989).

Empirical evidence in this research stream indicates these individual characteristics are related to important strategic outcomes. Finkelstein and Hambrick (1996) summarized hundreds of studies and reported that top management demographic characteristics have been found to be related to strategic actions as diverse as executive compensation decisions (Hitt & Barr, 1989), likelihood of strategic change (Wiersema & Bantel, 1992), international diversification strategies (Sambhraya, 1996) and analyses of competitors (Ireland et al., 1987).

While there is ample evidence that individual characteristics are related to variables of interest to strategy researchers (Finkelstein & Hambrick, 1996), little work has been done in which those characteristics have been linked directly to acquisition target valuation. Two studies in this research stream have attempted to identify individual influences on valuation behaviour.

In order to investigate the role of decision processes on acquisition valuation, Stahl and Zimmerer (1984) used a policy capturing method to model the valuation processes of 42 senior managers with recent experience in acquisitions. Participants were asked to value 32 hypothetical potential acquisition targets. The models derived from regression analysis showed strong internal consistency at an individual level. Average $R^2$ was 0.80 and the range was from 0.43 to 1, suggesting that each manager was consistent in attending to the same attributes and combining them in a similar manner when valuing different potential targets. However, there was little consistency between participants. The characteristics used by managers to value targets were individual specific. Variations between managers' valuations were due to differential weighting of target firm attributes. Industry factors, job titles and firm size were all unable to account for the variation in decision models. The authors concluded that some individual factors that they had not measured were linked to valuation behaviour. These factors influenced the information subjects attended to and the way it was combined.

Hitt and Tyler (1991) undertook a comparative test of the rational-normal, external control and strategic choice explanations for variation in strategic decision behaviour. The research focused on acquisition valuation judgement. Sixty-five senior executives were asked to value 30 hypothetical firms as potential acquisition targets. Strong support was found for the rational-normal approach with objective economic criteria explaining most of the variance in valuations. Support was also found for an external control perspective as industry characteristics were also related to these judgements. The authors also found that the personal characteristics of managers had both a main and interaction effect on the valuation judgement. Specifically, age, educational degree type, amount and type of work experience and organizational position were directly related to valuations and related to the decision models used by executives. These factors were explicitly described as proxies for cognitive factors. The results provide strong support for the strategic choice approach and emphasize the importance of cognitive characteristics as contributing factors in strategic decision making.

This research is important as it shows that individual factors are related to valuation behaviour. If these findings generalize to actual acquisition announcements then individual decision processes will have organizational performance implications. However, two issues arise when interpreting these findings.

First, it is problematic to identify systematic variation due to cognitive effects. Both Hitt and Tyler (1991) and Stahl and Zimmerer (1984) found that individual characteristics were related to variation in valuations, but did not identify consistent patterns in the way they influenced the magnitude of variation. While it is important to note that individual factors influence valuation, it is not possible to generalize to propositions about how such influence occurs in a systematic way. Therefore, it is difficult to predict what effect an individual decision maker will have on valuations, other than saying they will value the target differently to other managers. This severely limits the theoretical and practical utility of the findings.

Second, these studies used a hypothetical valuation task. Although the subjects were managers with experience in acquisitions, their results are not necessarily generalizable to actual acquisitions. The task performed by subjects was not fully equivalent to an actual valuation, a complex task in which the information available is ambiguous (Mason & Mitroff, 1981). In addition, Haunschild's (1994) findings of the importance of organizational factors on bids suggest that context may influence the final bid value.

To address the first issue requires the link between managerial characteristics and valuation outcomes to be located in an appropriate theoretical framework. The second of these issues is an empirical question. The generalizability of the findings may be established by assessing the impact of individual characteristics in applied settings. It is the purpose of the remainder of this dissertation to address these issues.

In summary, the literature reviewed in this chapter demonstrates that acquisitions do not always create value. In fact, they are often value-destroying. Negative abnormal returns result from the acquiror's overpayment for the target firm. Thus, examination of poor post-acquisition performance must explain the source of target valuations (acquisition premia) and the reasons they may be greater than the economic value of a target firm. There are three general approaches in the existing literature. First, economic explanations focus on the real benefits of an acquisition and attribute under-performance (over-payment in hindsight) to an inability to realize those benefits through imperfect implementation. Empirical evidence indicates synergy or inefficient management are frequently over-estimated as sources of value. Further, stock price adjustments at the time of announcement suggest that post-acquisition behaviour alone does not drive poor acquisition returns. The observation that market adjustments at the time of the acquisition announcement are significantly correlated with post-acquisition performance (Lubatkin, 1987; Sirower, 1997) suggests something in the nature of the bid leads to poor performance. Second, agency explanations argue that companies over-value targets because management seeks to derive a private benefit from the acquisition and this benefit determines bidding behaviour. Empirical support for agency explanations is mixed. However, an agency explanation is incomplete as it explains why managers are motivated to over-pay but does not explain other aspects of the premium. The third approach focuses on the difference between the true value of a target and the price paid, which is a managerial estimate of its value. As such, explanations of acquisition premia focus on the valuation process. This approach has not been subject to extensive empirical testing but existing research suggests this is a promising direction for further research. In addition, it is consistent with a large body of research showing the importance of managerial choice in other areas of strategy.

# CHAPTER 3: STRATEGIC CHOICE AND ACQUISITION VALUATION

The survey of existing literature presented in Chapter 2 highlights an interesting anomaly in organizational strategy. Acquisition strategies often do not lead to improvements in returns to a company, yet the number of acquisitions undertaken each year is considerable and has been increasing in recent times. In seeking to understand why acquisitions may be value destroying, scholars have identified reasons why companies choose such an action. One of the explanations focuses on the role of managerial valuation processes in the acquisition decision, arguing that estimates of future value will contain an error term. This approach is consistent with research on strategic decision processes, yet the phenomena has not received much attention in the literature. In this chapter I discuss the implications of this framework for acquisition bidding behaviour. In particular, I draw on behavioural decision theory to determine how managerial judgement processes may influence the error term in acquisition premia. This framework allows one to identify systematic biases in valuation judgement, when they are likely to occur and their effect on post-acquisition performance. The chapter begins by analyzing the valuation task. The task characteristics are then used to identify the information processes required and hence, systematic errors that may arise.

## *3.1 Acquisition Valuation Task*

As with all resource allocation decisions, acquisitions are essentially a bet placed by an organization (Sirower, 1997). Acquisitions are the purchase of a bundle of assets for a given price that are expected to produce a certain return with a defined probability distribution. Like other decisions, the acquisition decision is "a process of choosing between courses of action that are expected to produce different outcomes" (Beyer, 1981: p.166). Therefore, when considering whether to invest resources, managers will take into account the potential payoffs of the investment and the likelihood of attaining those payoffs.

Consider the example of a simple bet with two possible outcomes. The expected value of the gamble is the product of the payoff and the probability of winning. When asked to bid for the chance to play, the amount bid is a function of the probability of success and the expected payoff for success. An acquisition is essentially the same decision. An acquiror is paying a premium to acquire assets that may lead to an increase in value. Due to the inherent uncertainty of acquisitions these payoffs are only probabilistic. Indeed, barring inside information or unique, private synergies, these payoffs will be not only probabilistic but, by definition, unforeseeable (Barney, 1988). Even the payoffs associated with inside information or unique synergies are uncertain.

The expected value of the target should be a function of the estimates of these payoffs that result from the change in ownership of the target's assets and the probability of earning those payoffs. That is, the acquisition premium is determined by managerial estimates of the potential payoffs and the probability of achieving those payoffs. Therefore, the valuation task is essentially one of forecasting future cash flows.

However, acquisition valuation requires the use of complex decision models (Hitt & Tyler, 1991) in an information environment characterized by high uncertainty and ambiguous cues (Barney, 1988; Jemison & Sitkin, 1986). It is not easy to determine potential payoffs and probability distributions. In complex environments, cognitive limitations mean that decision makers are unable to attend to and process all relevant information (Schwenk, 1984). In order to function in these environments people will use simplifying decision processes "which reduce the complex task of assessing probabilities and predicting values to simpler judgmental operations" (Tversky & Kahneman, 1974: p.1124). For example, when asked to judge the probability that a person belongs to a group, people typically base that judgement on the extent to which the person resembles those in the group (Kahenman & Tversky, 1972). This is known as the representative heuristic (Tversky & Kahneman, 1974). These simplifying processes result in biases that have been shown to persist in many laboratory judgement tasks (see Hogarth, 1981 for a review). They are important in the study of judgement under uncertainty because they may lead to "severe and systematic errors" (Tversky & Kahneman, 1974: p.1124).

Organizational researchers recognized that managers may be subject to similar biases and heuristics in policy formulation and began to examine the implications for organizational performance (Barnes, 1984; Bukszar & Connolly, 1988; Kahneman & Lovello, 1993; Schwenk, 1984). For example, Schwenk (1984) argued that biases including anchoring and adjustment, the illusion of control and the representative heuristic may lead to distortions in the problem formulation, alternative generation and alternative evaluation phases of strategy formulation. Kahneman and Lovello (1993) proposed that a tendency to treat investment opportunities as unique may lead to overly risk-averse behaviour in organizations. To date, most of the work in this field has been conceptual. However, some empirical work has clearly demonstrated the impact of these biases on strategic decision making. Bukszar and Connolly (1988) showed that the hindsight bias, a bias in recollection in which past events are seen as being more predictable than they were at the time of action, hinders managers' ability to learn from experience. Bateman and Ziethaml (1989) found that both managers and student subjects showed evidence of escalation of commitment in resource allocation decisions in a laboratory task. In reviewing the empirical evidence on bounded rationality in the strategic decision process literature, Eisenhardt and Zbaracki (1993) note that cognitive processes impact strategy and suggest that one way to achieve a more realistic view of policy formulation is to study the heuristics of managerial choice.

Camerer (1987) has argued that research in judgement biases may lead to economic theory with greater predictive power. More specifically for current purposes, although no empirical work has been done in this area, theorists have argued that processing heuristics are likely to result in systematic distortions in acquisition decisions. Duhaime and Schwenk (1985) propose that poor acquisitions performance may be attributed to biases introduced into the acquisition decision by the use of processing heuristics. Kahneman and Lovello (1993) posit that over-payment for acquisition targets may result from biases in the forecasting process used to value these targets. In the remainder of this chapter I draw on the behavioural decision making literature to identify systematic distortions in target valuations that may arise due to managerial cognitive processes. I focus on a specific decision bias, the illusion of control. In doing so, I aim to account for some variation in acquisition premia paid and address one reason why acquisitions may not lead to improvements in shareholder returns.

### *3.2 Forecasting and Managerial Valuation of Target Firms*

As discussed above, the task of valuing a potential acquisition target is essentially one of forecasting future cash flows. As these forecasts are made in an uncertain environment by managers acting on behalf of the firm, they reflect the judgement of individual executives. Existing psychological research on forecasting judgements of financial performance shows that subjects, regardless of whether they are experts or novices, do not perform particularly well when asked to estimate future outcomes. Staël von Holstein (1972) asked subjects to make probabilistic forecasts of stock price movements in a two week period. The subjects were given feedback on their performance at the end of the two week period and then asked to make forecasts for the next two weeks. The results showed that feedback did not lead to improved forecasts. In addition, the subjects were surprisingly inaccurate in their forecasts. Of the 72 subjects, only 3 outperformed a simple model that assigned equal probability to all outcomes. Yates et al. (1991) replicated these results over longer prediction periods. They also found that subjects' forecasts of company earnings had low accuracy. Johnson (1988) reports similar findings among subjects asked to forecast stock price movements over a twelve month period.

In seeking to explain why financial forecasting accuracy is poor, especially among experts, most researchers have focused on the forecasting process. Yates et al. (1991) argue that subjects often focus on irrelevant cues when making judgements. Johnson (1988) explains his findings by showing that subjects tend to focus on rare events and undervalue base rate information. These findings are consistent with the considerable body of research in behavioural decision theory indicating that subjects do not effectively incorporate base rate information when making judgements (Bar-Hillel, 1973; Borgida & Nisbett, 1977; Kahneman & Tversky, 1973).

Kahneman and Tversky (1979) propose that the under-utilization of base rate information is due to the manner by which people make forecasts. This leads to expectations that are systematically biased. They distinguish between two modes of thought in making forecasts. In one mode (the inside view) the subject focuses on the unique aspect of the case at hand and extrapolates current trends to create a scenario of the history of the future. The second mode (the outside view) focuses on statistical information in which the current case is placed within a distribution of comparative cases and the outcome is forecast on the basis of historical statistical information about the referent class. Kahneman and Tversky (1979) argue that the inside view is the most intuitively appealing psychologically, and therefore will be more prevalent in forecasting. However, this forecasting process leads to errors because of the use of decision heuristics and biases (Dawes, 1988).

The second characteristic of the target valuation task that is relevant to understanding acquisition premia is that acquiring companies are bidding for control of the target. The forecast value implied by the bid is an estimate of the future value of target assets under their control. Thus, a bias of particular relevance to acquisition valuation is the illusion of control (Schwenk, 1984, 1988; Zajac & Bazerman, 1991).

### 3.2.1 Illusion of Control

In a series of experiments, Langer (1975) demonstrated that subjects often respond to chance events as if they had some control over the outcome. She described this exaggerated belief in the importance of their actions as the "illusion of control." This bias arises when features typical of a 'skill' situation (i.e. choice, stimulus or response familiarity, active involvement and competition) are introduced in a 'chance' situation. As a result, subjects behave as if it were a skill situation and over-estimate their control over the outcomes. For example, by promoting 'skill' attributions through performance feedback, Langer and Roth (1975) were able to show that subjects could be induced to believe they could manipulate the outcome of a fair coin toss. In addition, 40% of subjects stated they could improve their performance in coin tossing with further training.

Managerial judgement takes place in a context characterized by choice, familiarity, active involvement and competition. Therefore, managers are likely to believe that they have influence in determining outcomes. Field studies of managerial risk taking support this argument. Based on interviews with executives, both March and Shapira (1987) and MacCrimmon and Wehrung (1986) report that senior managers believe they have considerable influence over outcomes. Indeed, March and Shapira note that managers refuse to accept risk as fixed and believe it can be altered by their actions.

An acquiring firm is paying a premium to acquire control over a target firm and so it has been argued that this illusion of control leads managers to over-estimate the importance of their actions in determining the success of an acquisition (Duhaime & Schwenk, 1985; Schwenk, 1988; Zajac & Bazerman, 1991). This bias has important implications for judgement behaviour (e.g. Langer & Roth, 1975), and will impact how managers value acquisition targets (Duhaime & Schwenk, 1985).

Research in behavioural decision theory shows that events over which people believe they have some control tend to be judged as more likely to occur than objective calculations indicate (Howell, 1967,1970, 1971; Langer & Roth, 1975; Lichtenstein & Fischoff, 1977). This confidence bias has been shown to lead subjects to bid consistently higher than the expected value of gambles for the opportunity to play them (Fischhoff, Slovic & Lichtenstein, 1977; Heath & Tversky, 1991). This implies that managers, believing they have some control over outcomes, will consistently over-value acquisition opportunities and will pay a premium to acquire a target firm. Thus, one may argue that the payment of acquisition premia is a special case of the over-confidence bias that occurs because of the illusion of control. However, to empirically verify such a proposition requires that one consider the implications of the illusion of control on bidding behaviour. Specifically, one must address the systematic variation in valuation such a bias implies.

### 3.2.2. Perceived Competence

When subjects feel they are able to control outcomes, judgements of future performance are a function of the subjects perceived competence in the task (Howell & Burnett, 1978). Therefore, when subject to the illusion of control, subjects' estimates of future performance will be based on their perceived competence (Langer & Roth, 1975). Acquisition premia represent judgements of future earnings. If the illusion of control results in distortion of target valuation behaviour (as reflected by the acquisition premia), then variation in perceived competence should result in systematic variation in the size of acquisition premia.

Research on forecasting tasks indicates that performance feedback and task relevant knowledge are two primary factors linked to perceived competence (Johnson, 1988; Mahajan, 1992; Spence & Brucks, 1997; Yates et al., 1991). In the following sections I discuss how these factors and a third, a general sense of self-confidence, may be related to acquisition target valuations.

In addressing the nature of managerial confidence Hayward and Hambrick (1997: p.124) suggest that it is "part enduring trait, part conditional or temporary phenomenon." As a measure of the enduring aspect of hubris they examine executive compensation, citing interviews with several managerial placement experts who attribute large pay differentials among senior management and CEOs to CEO self-confidence. Hence, they argue that the relative compensation of a CEO serves as an indicator of the CEO's hubris, and will be positively correlated with the size of acquisition premia. They note that CEOs have considerable influence over their own compensation and that of other senior management in the organization. Therefore, the ratio of CEO compensation to that of the next highest paid officer of the company can serve as a proxy for the CEO's estimate of his or her relative contribution to the firm. This line of argument is consistent with an equity theory analysis of perceived contributions. Hayward and Hambrick (1997) found empirical evidence that relative compensation and acquisition premia are positively related. Therefore, it is hypothesized that the current research will replicate these findings.

> **Hypothesis 1**: A CEO's compensation relative to that of the next highest paid officer in the firm will be positively related to the size of acquisition premium in a bid.

Another factor that will influence a manager's perceived competence is his or her level of task relevant knowledge or expertise. Prior experience teaches people that they generally perform better in areas in which they are knowledgeable compared to those in which they are not (Heath & Tversky, 1991). This is reflected in research showing that confidence in performance increases with expertise (e.g. Johnson, 1988; Mahajan, 1992; Yates et al., 1991), especially when subjects feel able to influence outcomes (Spence & Brucks, 1997). Therefore, managers with greater expertise will have higher perceived competence and, if subject to the illusion of control, this will be reflected in their estimates of the increase in value in target assets once they are under their control.

Expertise is task relevant knowledge. Expertise is often defined as arising from experience (e.g. Hoffman, Shadbolt, Burton & Klein, 1995), and an expert as "someone who has acquired domain-specific knowledge through experience and training" (Spence &

Brucks, 1997: p.233). Organizational researchers have shown that organizational experience influences managerial knowledge. For example, Reger and Palmer (1996) examined the mental models of executives in the financial services industry. By studying these models within and between subjects over time they found that managers in more turbulent environments tended to have more diverse constructs in their models than those in more stable environments. This suggests that exposure to an environment influenced knowledge structuring.

Similarly, Söderlund and Vilgon (1993) examined the way in which executives at Swedish Telecom explained the actions of the organization over time during a period of considerable change in the Swedish telecommunications industry. They found that the structure of managers' models changed as the mental models became more inter-linked and greater attention was given to links within the environment. Daniels, Johnson and de Chernatony (1994) found that the diversity in cognitive models was greater between organizations than within organizations, suggesting that shared experiences promote similarities in the structuring of knowledge.

Hodgkinson and Johnson (1994) sought to uncover the taxonomic mental models held by managers in the U.K. retail grocery industry. Their findings showed that managers' knowledge structures differed both within and across organizations. These studies suggest that managers acquire knowledge through their organizational experiences. However, the type of experience is also important in developing knowledge. In their study of managers in the British grocery industry, Hodgkinson and Johnson found that the functional experience of managers influenced their knowledge base. They found that managers with experience in a particular functional area of an organization had more knowledge in that area. For example, a marketing manager had a more developed understanding of the factors leading to successful marketing than those in other functional areas.

It is apparent that organizational experience in a functional area is important in determining a manager's knowledge. Educational background also provides a framework of knowledge (Hambrick & Mason, 1984). However, expertise is not based on possession of knowledge alone. The knowledge must be domain specific or relevant to the task being performed (Spence & Brucks, 1997). In the current study this is the valuation of a potential acquisition target.

The primary role of an organization's senior management is to cope with uncertainty (Spender, 1987; Thompson, 1967). Hence, in a managerial context, domain relevant knowledge is that which allows the manager to cope with critical environmental contingencies. Environmental requirements may be defined by measuring the source of uncertainty. Therefore, managerial expertise may be assessed by matching functional and educational experience with environmental requirements as delineated by the predominant sources of uncertainty (Haleblian & Finkelstein, 1993). In valuing potential targets, it is the environmental contingencies in the target's industry that are most relevant. Hence, a CEO's task relevant knowledge or expertise is defined as the match between his or her educational and functional background and the type of uncertainty in the target firm's industry.

As expertise is proposed to increase feelings of competence and perceived competence to influence forecasts of future performance, I offer the following hypothesis.

**Hypothesis 2**: The level of expertise of the CEO of the acquiring firm, as defined by the match between functional and educational background with the source of uncertainty in the target industry, will be positively related to the size of premium in an acquisition announcement.

The second primary factor related to perceived competence in forecasting tasks is performance feedback (Mahajan, 1992). There is considerable evidence that there is a tendency to attribute good past performance to the self. Attribution theory argues that subjects are likely to attribute outcomes to their own actions (Ross & Sicoly, 1979). The effect is especially pronounced when outcomes are positive (Miller & Ross, 1975). This self-serving attribution bias has been well documented (Miller, 1976; Mullen & Riordan 1988; Schlenker & Miller, 1977) and is more likely when feedback focuses on outcomes rather than processes. Managers receive feedback that is outcome based and confounded with many possible causes (Huber, 1991), a context that promotes self-serving attributions. This tendency for managers to claim credit for past organizational success has been observed in both interviews (March & Shapira, 1987) and in letters to shareholders in annual reports (Salancik & Meindl, 1984). The illusion of control leads managers to believe that future outcomes may be influenced by their behaviour. As they claim responsibility for past outcomes, past performance is seen as a legitimate indicator of future performance.

The availability heuristic refers to a tendency by decision makers to judge the probability of a future event based on the ease with which they are able to recall past occurrences (Kahneman & Tversky, 1972). Therefore, when making judgements about the probability of being able to successfully manage a target firm, they will base judgements on the availability of past successful performance in their memory. Recent performance is likely to be available and highly salient and influence judgements of the likelihood of similar future occurrences. This effect has been observed in laboratory studies where subjects who perform well on prior tasks report greater confidence in future trials than subjects who perform poorly (Mahajan, 1992). Therefore, managers with recent positive performance will judge future positive performance more likely and pay higher acquisition premia. This positive relationship between firm prior performance and premia has been observed by Bugeja and Walter (1995) and Hayward and Hambrick (1997).

> **Hypothesis 3**: An acquiring firm's returns in the year prior to announcement of an acquisition will be positively related to the size of the premium in the bid.

One measure of performance feedback that has been used in studies of acquisition valuation is the press coverage of a CEO (Hayward & Hambrick, 1997). However, media praise for a leader may be confounded with firm performance (Chen & Meindl, 1991). Further, Hayward & Hambrick (1997) were only able to identify media coverage on 61 CEOs in their sample of 106 firms, suggesting that this measure may also be confounded with the public profile of the firm and the CEO. Therefore, this measure was not used.

### 3.2.3 Uncertainty

The hypotheses described above are consistent with the hubris hypothesis (Roll, 1986) in arguing that managerial over-estimation of value leads to poor performance in acquisitions. However, it is the aim of this research to extend this work by showing that these forecasts are the result of managerial judgements and are subject to systematic errors. In order to test this line of reasoning it is necessary to examine a context in which one can discriminate between consistent errors of valuation and the effects of the judgement processes described above. The hypotheses above were developed from the proposition that acquisition premia result from systematic biases in the valuation judgement processes. A second important implication of this argument is that these biases should be more pronounced when there is greater reliance on judgement in the valuation process.

Researchers have recognized the importance of the decision context in studies of strategic decision making (Schwenk, 1995, Rajagopalan et al., 1993, Zajac & Bazerman, 1991). One of the most important contextual variables in organizational decision making is uncertainty (Zsambok, 1997). Several organizational scholars have argued that the level of uncertainty faced by managers will impact strategic decision processes. Schwenk (1984, 1988) suggested that high environmental complexity may lead to greater use of cognitive simplification processes in organizational decision making. Thompson (1967) points out that rational process is only sensible when cause-effect relationships are understood. Similarly, Thompson and Tuden (1959) note that managerial judgement becomes more important as uncertainty increases. Empirical evidence supports these arguments. Leblebici and Salancik (1981) examined loan approval decision making in banks and found that loan officers relied more on judgement as uncertainty increased. Dean and Sharfman (1993) examined 57 decisions made in 24 manufacturing firms in 16 industries. They found that increasing uncertainty was related to less use of rational decision processes.

A systematic effect due to judgement is likely to be more evident when the level of uncertainty is high as "when work is not analyzable, participants rely on judgement or experience rather than on ... computational routines" (Daft & Lengel, 1986; pp.563-564).

As uncertainty increases, environmental cues become less informative of future outcomes. In such situations the typical response of the decision maker is to rely on other factors to determine appropriate behaviour. Social psychologists have noted the tendency to rely on dispositional factors rather than situational cues when acting in uncertain environments (e.g. Mischel, 1977; Nisbett & Ross, 1980). Boyd and Fulk (1996) identified this response in managers. Their research indicated that managers engage in less scanning activity when the environment is seen as less analyzable, suggesting they were using other information to make decisions. Haunschild (1994) found a similar phenomena in acquisition valuations. In her sample, there was a significant relationship between the size of acquisition premia offered and the size of acquisition premia paid by firms with common directors. This relationship between the bidding behaviour of firms with interlocking directorates was stronger under conditions of high uncertainty. She argued that as uncertainty increased, firms would look to non-economic cues when valuing targets.

As uncertainty increases, managerial judgement becomes more important in estimating future returns from a target firm. As I have argued above, this judgement is systematically distorted and leads to higher valuations in the form of large acquisition premia. Therefore, one may predict that the level of uncertainty faced by the decision maker will be positively related to the size of acquisition premium. Further, the judgement processes leading to the estimate of value will be more apparent when the level of uncertainty is greater.

**Hypothesis 4**: The level of uncertainty in the target industry will be positively related to the size of the acquisition premium.

**Hypothesis 5a**: Measures of perceived competence, namely relative pay, previous performance and expertise, will not be related to the size of the acquisition premia bid for targets in industries in which change is relatively predictable.

**Hypothesis 5b**: Measures of perceived competence, namely relative pay, previous performance and expertise, will be positively and significantly related to the size of the acquisition premia bid for targets in industries in which change is relatively unpredictable.

### *3.4 Performance Implications*

In the discussion above I have argued that managerial estimates of target value will be distorted by information processing biases and that these biases will lead to systematic over-valuations of targets. Specifically, managers making acquisition offers are bidding for control of a firm and are likely to be influenced by the illusion of control. The market valuation, as reflected in the pre-announcement stock price, is not based on control of target firm assets and therefore will not be influenced by the illusion of control. Hence, managerial valuations are predicted to differ systematically from market valuations.

In this chapter I have discussed reasons why this error term is likely to be positively biased and factors that would influence its size. If the error term is systematically biased upwards, then the premium offered will represent an over-payment. This over-payment will result in negative abnormal returns. The prevalence of negative abnormal returns to acquiring firms is well documented in the literature, both at announcement (Bradley et al., 1988; Morck et al., 1990; Sirower, 1997) and over the longer term (Agrawal et al., 1992; Bradley et al., 1988; Dodd & Ruback, 1977; Sirower, 1997). Therefore, one may hypothesize a similar effect in the current sample.

The effects of an acquisition announcement on stock price are typically reflected very quickly in stock price movement (e.g. Morck et al., 1990). This stock movement can have a significant impact on the market value of a firm and hence shareholder wealth. For example, Quaker Oats lost $500 million in market value on announcing its offer to acquire Snapple Beverage. The time period used to measure this short-term effect should be short enough to capture the immediate response of the market to the acquisition announcement yet long enough to allow the full absorption of information in the announcement by the market. Studies of short-term response to announcement typically focus on a time period ranging from 5 days prior to announcement and 5 days subsequent to announcement day returns (e.g. Bradley et al., 1988; Morck et al., 1990; Sirower, 1997). These studies have shown that measures within this time period are highly correlated (Sirower, 1997) and show very similar effects (Morck et al., 1990). An event window of 11 days around and including announcement day was chosen so that pre-announcement stock prices would not be affected by leaked information and so that the information would be fully incorporated by the market into post-announcement prices.

**Hypothesis 6a**: The average abnormal returns to acquiring firms in the 11 day period around announcement will be negative.

As described in Chapter 2, empirical evidence indicates that acquisitions may lead to negative abnormal returns for longer periods after announcement. This literature has identified negative returns to acquirors for up to five years post-acquisition (Agrawal et al., 1992). However, as the time period over which the effect is studied is expanded the potential for the effect of acquisitions on abnormal returns to be confounded with other events increases (Magenheim & Mueller, 1988). Therefore, long term effects may be anticipated to be manifest in the 12-month and 24-month period following announcement.

**Hypothesis 6b**: The average abnormal returns to acquiring firms in the 12 month period following announcement will be negative.

**Hypothesis 6c**: The average abnormal returns to acquiring firms in the 24 month period following announcement will be negative.

Hypothesis 6 proposes that, on average, an acquisition will lead to negative outcomes for acquiring firms. However, as noted by Sirower (1997), it is of considerable practical interest to determine if there is something in the nature of the bid that is indicative a priori of future returns. Sirower (1997) argues that the size of the acquisition premium will be negatively related to the performance, an argument that is implicit in Hayward and Hambrick's (1997) work but is not explicitly developed by them. Sirower proposes that premia reduce future performance by increasing the returns that must be earned to maintain current levels of performance. As there are limits to the amount of earnings improvements possible, premia frequently result in reduced performance. He finds substantial support for his hypothesis, showing that the size of acquisition premia is negatively related to abnormal returns over several time periods. Hayward and Hambrick (1997) find partial support for the argument, showing a negative relationship between premia and performance in their sample over a one year period but not in short-term returns.

However, the hubris hypothesis (Roll, 1986) does not necessarily imply that the size of acquisition premium be related to future performance. Recall from Equation 2.4 that the premium represents the true value of synergies plus an error term. A positive error term represents over-payment and leads to negative abnormal returns. If this error is independent of the size of the premium, there will be no relationship between the premium and subsequent performance. If, however, the error term is correlated with the size of the premium there will be a negative relationship between premia and performance. Sirower (1997) argues that, as limits to the available synergies exist, larger premia will have larger errors and hence lead to worse performance. Therefore, I offer the following hypotheses. Failure to reject the null hypotheses would indicate that the valuation error is independent of the size of the premium.

> **Hypothesis 7a**: The size of acquisition premium paid is negatively related to the performance of the acquiring company in the 11 day period around the announcement of the bid.

> **Hypothesis 7b**: The size of acquisition premium paid is negatively related to the performance of the acquiring company in the 12 month period following the announcement of the bid.

**Hypothesis 7c**: The size of acquisition premium paid is negatively related to the performance of the acquiring company in the 24 month period following the announcement of the bid.

# CHAPTER 4: METHOD

The review of prior research conducted in Chapter 2 indicates that acquisitions, although a popular strategic action, frequently have negative implications for firm performance and that this poor performance is due in part to over-payment. Using a strategic choice approach, in Chapter 3 I drew on the behavioural decision making literature to provide an explanation for the persistent over-valuation of target firms. In this chapter I describe the method by which I tested these arguments empirically.

Section 4.1 describes the research design and sample used to test the hypotheses. In Section 4.2 the first part of the design is discussed. The purpose of this part of the research was to identify factors that influence the size of acquisition premia. The measures and data sources used are discussed. Section 4.3 concludes the chapter by describing the operationalization of variable and data sources used in the second part of the design. In this section I examined the link between acquisition premia and subsequent firm performance.

## *4.1 Research Design*

The impetus for this research stemmed from a desire to understand the origins of acquisition premia. In Chapter 3, I argued that these premia arise from the nature of the valuation task, namely one of judgement under uncertainty. Recent work on applied decision making emphasizes the importance of contextual factors in influencing decision behaviour (e.g. Orasanu & Connolly, 1993; Zsambok, 1997). Contextual factors that are especially relevant in organizational settings include not only uncertainty but also conflict, incentives and timing (Shapira, 1997). In addition, the acquisition bid task involves an external reference for value, the market price (Roll, 1986). These contextual factors are impossible to simulate in the experimental tasks that are commonly used to investigate decision behaviour. Therefore, it was necessary to examine this behaviour in the field by analyzing actual acquisition bids.

The research design comprised two parts. The first was a cross-sectional study that attempted to identify several features of the individual, organization and industry that influence bidding behaviour. This method has been used in past research on the sources of acquisition premia (Haunschild, 1994; Hayward & Hambrick, 1997). The second part linked this bidding behaviour to firm performance using an event study design. The event study design is prevalent in studies of acquisition behaviour (e.g. Berkovitch & Narayan, 1993; Lubatkin, 1987; Morck et al., 1990; Sirower, 1997; Slusky & Caves, 1991; Varaiya, 1987) as it allows the examination of the phenomena in a natural setting and provides an ability to isolate factors of interest. The research used archival data on recent acquisition bids involving public corporations.

### *4.2 Determinants of Acquisition Premia*

To summarize the general arguments presented in Chapter 3, acquisition premia represent managerial estimates of the future value of a target firm's assets once under their control. It is argued that these estimates are a function of both the economic value of the target assets and the processes used to value them, as presented in Equation 4.1 below. This general model was tested empirically by estimating regression models.

$$\text{Acquisition premium} = f\,(\text{valuation process, economic factors}) \qquad [4.1]$$

Multiple linear regression permits the simultaneous study of the relationship between a dependent variable and several explanatory variables (Jobson, 1991). This research design has been used in prior research on the sources of acquisition premia (Haunschild, 1994; Hayward & Hambrick, 1997; Slusky & Caves, 1991). Its use in this study allowed me to test the hypothesized effects of the valuation process on the size of acquisition premia while controlling for the effect of the economic factors commonly cited in studies of acquisition activity. These economic factors are described below in Section 4.2.3.

### 4.2.1 Sample

The sample for this dissertation comprised all acquisitions announced in 1994 and 1995 in which both the acquiror and target were listed on the New York Stock Exchange, NASDAQ or the American Stock Exchange. The decision to limit the sample to these firms was based on data availability. The years 1994 and 1995 were chosen as they represented the most recent time periods for which data was available.

An underlying assumption of my discussion in the previous two chapters is that acquisition premia represent extra value a company can extract from a target once that company's assets are under the control of the acquirer. Therefore, only those bids were considered where the acquirer increased its stake beyond the U.S. Securities and Exchange Commission defined threshold of control. Hence, offers in which the acquiring company bid for less than 20% of the target were excluded. "Clean-up offers" in which the acquiror purchases the remaining shares of a company in which it already had partial ownership were also excluded from the sample.

Further, only those acquisitions with an offer price of greater than $100 million were included. There were two reasons for this. First, the acquisition must be large enough that it represents a significant strategic decision that has the potential to influence firm performance. Second, it must be significant enough that it moves out of the routinized decision processes and involves the judgement of senior management, particularly the CEO (Kahneman & Lovello, 1993). Previous research (e.g. Hapeslagh & Jemison, 1991) suggests that CEOs are heavily involved in large dollar value acquisitions.

Potential acquisition announcements were identified using the Mergerstat Review (1994, 1995). During 1994, 76 acquisitions were announced where both acquirer and target were listed on one of the three major U.S. exchanges. Of these, in two cases the acquiring firm was itself acquired within the twelve month period following the initial announcement. These cases were removed from the sample, as were a further 19 announcements because either the acquiror or target were not listed in Standard & Poor's Compustat database. In 1995, 95 acquisitions involving two listed firms were announced. In one case the acquiror was the subject of a takeover in the following 12 months. In 14 cases data for at least one party was not available in the Compustat database. These 15 cases were removed from the sample. The final sample consisted of 55 cases from 1994 and 80 cases from 1995 giving a total sample of 135 announcements. The sample includes acquiring firms from 68 different 4-digit SIC industries and targets in 84 different industries. A full listing of each acquisition is provided in Appendix A.

This sample size is sufficient to detect a large or medium effect size in multiple regression analysis at $\alpha = 0.05$ and a power of 0.80 (Green, 1991). The determination of adequate sample size to detect multiple correlation depends on the choice of level of power, alpha, number of predictor variables and the effect size. The multiple regression analyses conducted in this dissertation incorporate a maximum of 12 predictor variables. Although it is impossible to specify the effect size a priori, existing research on the sources of acquisition premia has found effect sizes in the range of $R^2 = 0.17$ and above (Haunschild, 1994; Hayward & Hambrick, 1997; Slusky & Caves, 1991). Green (1991) defines a medium effect size as $R^2 = 0.13$ and a large effect size as $R^2 = 0.26$. Therefore, conservatively one may anticipate a medium effect size in the analyses in this research.

To achieve a power of 0.80 at $\alpha = 0.05$ with 12 predictor variables and a medium effect size, Green's (1991) rule of thumb determines that a sample size of 127 is required. This rule of thumb is based on Cohen's (1988) power analysis, and provides estimates of sample size that are more conservative than Cohen for small and medium effect sizes with greater than 5 predictor variables. The current sample size is also consistent with prior research in the area (e.g. Hayward & Hambrick, [1997], n = 106; Sirower, [1997], n = 168; Slusky & Caves, [1991], n = 100), and was considered sufficient to detect the determinants of acquisition premia.

### 4.2.2 Dependent Variable

#### Acquisition Premium

The dependent variable acquisition premium was measured by calculating the ratio of the amount bid for a target to its market value prior to the bid. This method of calculating the premium allows for the effect to be a proportion rather than a difference, thereby controlling for the effect of the size of the target (Morck et al., 1990).

It is important that the pre-bid value of the target be unaffected by news of the takeover. A pre-bid value taken 5 days prior to an announcement is common in the literature (e.g. Morck et al., 1990; Sirower, 1997) and is used in many databases such as

Mergerstats' Mergers and Acquisitions. Therefore, acquisition premia were calculated using stock prices 5 days prior to announcement.[1]

The offer price ($P_{offer}$) was obtained from the tender offer as described on SEC Form 14(D) when one was filed. If the acquisition was not a tender offer, the offer price was obtained from the Mergers and Acquisitions database.

The acquisition premia were calculated using Equation 4.2. The target stock price 5 days prior to announcement of the acquisition ($P_{-5}$) was taken from the CRSP database. The market return adjustment ($R_m$) is the CRSP equally weighted market return over the 5 day period prior to announcement.

$$\Pr emium = \frac{P_{offer} - P_{-5}}{P_{-5}} - R_m \qquad [4.2]$$

### 4.2.3 Independent Variables

**CEO Relative Compensation**

Following Hayward and Hambrick (1997), CEO relative compensation was operationalized as the ratio of CEO cash compensation to that of the next highest remunerated company officer in the year prior to the acquisition announcement.

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[1] Some researchers have suggested that news of a takeover offer may leak out as much as a month prior to the announcement date (Magenheim & Mueller, 1988), leading researchers to use premia calculated on 30 day windows (e.g. Varaiya, 1987). Therefore, the acquisition premium was also calculated using the target stock price 30 trading days prior to announcement. The two measures of premia were positively correlated ($r = 0.844$, $p < 0.001$). Analyses using this variable yielded very similar results to those reported in this study.

Compensation data was obtained from company proxy statements filed with the U.S. Securities and Exchange Commission.

## Expertise

In the discussion above, expertise was defined as domain specific knowledge gained through experience or training (Spence & Brucks, 1997). Therefore, expertise may be operationalized as the experience or training one has received that is relevant to the task, that is, valuing the target. Following Haleblian and Finkelstein (1993), CEO expertise was measured in a three step process. First, the extent of an individual's training or experience was measured. The relevance of this experience to the valuation of a target firm was then assessed. Finally, expertise was calculated as the product of the amount of experience and the relevance of that experience.

Data regarding the educational background of managers was obtained from Dun & Bradstreet's (1993, 1994) Reference Book of Corporate Managements. The educational background of CEOs was classified into one of eight categories. These categories were taken from Hambrick, Cho and Chen (1996) and include: engineering; science; business administration; economics; liberal arts; law; business (other than administration) and other. CEOs were assigned to these categories on the basis of the discipline of their graduate degree if applicable, otherwise on the basis of their undergraduate studies. CEOs without a university degree were not assigned to any category.

Functional experience was determined in similar manner. Data regarding prior functional responsibilities was obtained from the Reference Book of Corporate Managements. CEOs were classified into one of seven functional areas:

production/operations; finance/accounting; marketing; sales or merchandising; research and development; self-employed; general management or law.

Second, the sources of uncertainty in the target industry were identified. This was achieved by scoring the relative prevalence of articles listed in Predicast's F & S Index (1993, 1994) addressing different sources of uncertainty (Haleblian & Finkelstein, 1993).

The Predicast F & S Index contains abstracts describing the contents of articles in the business and trade press listed by industry. These listings for 1993 and 1994 were reviewed for each 4-digit SIC code in the target sample and categorized on the basis of the source of uncertainty they emphasized. Adapting the measures of Haleblian and Finkelstein (1993) slightly, for each industry three sources of uncertainty in the task environment were considered: outputs, throughputs and regulatory. Articles emphasizing demand and market conditions were classified as relating to output uncertainty, those emphasizing production were classified as relating to throughput uncertainty and those discussing legal and regulatory issues were classified as relating to regulatory uncertainty. Haleblian and Finkelstein (1993) included a fourth source of uncertainty, supply conditions. Review of the articles listed in the Index indicated that supply conditions were not a relevant source of uncertainty for many of the industries in the sample and so this measure was not included in the analysis. The relative importance of the sources of uncertainty was calculated as the number of articles emphasizing that source of uncertainty in an industry listing divided by the total number of articles in that industry list.

Third, the educational and functional categories were matched against the sources of environmental uncertainty. Functional experience in market/sales, product research and development or business administration (other than finance or accounting) were classified as relevant to output uncertainty. Experience in production/operations or finance/accounting were classified as relevant to throughput uncertainty. Legal experience was classified as relevant to regulatory uncertainty. Similarly, the educational background categories were matched against the source of uncertainty. Business administration or economics were assigned to output uncertainty; engineering, science or accounting/finance to throughput uncertainty; and legal to regulatory uncertainty.

Two measures of expertise were obtained. First, educational expertise was calculated by matching the educational background of the CEO to the sources of uncertainty in the target industry. This measure was scored as the proportion of articles emphasizing the source of uncertainty relevant to the CEO's educational background. For example, in the retail drug store industry (SIC = 5912) 0.04 of the articles cited in Predicast's F & S Index emphasized input concerns, 0.33 output, 0.50 throughput and 0.13 regulatory issues. Therefore, a CEO with an educational background in economics (relevant to output uncertainty) would have an educational expertise score of 0.33. Functional expertise was calculated similarly. To continue the above example, if a CEO had functional experience in finance (relevant to throughput uncertainty) he or she would have a functional expertise score of 0.50.

**Prior Performance**

Prior performance for both acquiror and target was measured as the company return on equity for the prior year less the average return on equity in the company's primary industry at the 4-digit SIC level. The firm and industry returns were calculated from data extracted from the Compustat database.

Accounting returns were used as they reflect actual performance in the time period rather than expectations of future performance. These returns were adjusted for industry average returns to remove industry effects on performance and accounting conventions and allow comparison across industries.

**Environmental Uncertainty**

Attempts to operationalize environmental turbulence in management research have focused predominantly on measures of variation in key measures of industry characteristics (Bourgeois, 1985; Snyder & Glueck, 1982; Tosi, Aldag & Storey, 1973). However, these measures of uncertainty do not strongly correlate with the subjective uncertainty experienced by managers (Downey, Hellreigel & Slocum, 1975; Downey & Slocum, 1975; Duncan, 1972). It has been argued this is because the key attribute of turbulence is not the amount of change but the predictability of change (Lawrence & Lorsch, 1967; Starbuck & Milliken, 1988; Wholey & Brittain, 1989). This suggests that research should focus on predictability of change. For example, Dess and Beard (1984; p.56) state that "dynamism should be restricted to change that is hard to predict and that heightens uncertainty for key organizational members."

Wholey and Brittain (1989) decomposed fluctuation in key industry measures into three components: frequency, amplitude and predictability. Testing these objective measures against perceptions of uncertainty amongst managers in manufacturing firms and restaurants, they found that frequency and amplitude alone did not influence perceived uncertainty as managers were able to anticipate them. Predictability of change was more important to perceptions of uncertainty. In order to quantify predictability they used a measure that regresses an industry characteristic on that characteristic lagged one year. This detrends and excludes seasonal or cyclical, and hence predictable, variation.

Prior research on industry uncertainty has focused on variation in factors such as sales or shipments (e.g. Haleblian & Finkelstein, 1993; Rajagopalan & Datta, 1996). Tosi et al. (1973) focused on three types of uncertainty: market, firm and technical. These were measured using industry sales, profits before tax and research and development and capital expenditure. Bourgeois (1985) added a fourth factor, Department of Commerce projected output, to those used by Tosi et al. (1973). I chose to follow this research as it was explicitly intended to allow comparison of uncertainty across industries. Projected output was not included as a measure of uncertainty as output figures are not readily comparable across industries.

Tosi et al. (1973) originally proposed that variation in these three industry factors represented three different types of uncertainty. However, in a subsequent study using the coefficient of variation of the first differences of the same three characteristics and a fourth (Department of Commerce projections of industry output for the next year) Bourgeois (1985) identified two factors that accounted for 63% of the total variance in industry uncertainty. One factor loaded on sales, income and projected output variation and represented commercial volatility. The other factor loaded on research and development and capital expenditure and represented technological volatility. Therefore, sales and profitability predictability were combined to form single measure of commercial uncertainty.

The industry characteristics data was obtained from the Compustat database. Firm level data was aggregated at the four digit level Standard Industry Classification (SIC). Commercial uncertainty was calculated by regressing each characteristic by that characteristic lagged one year, over the eight years prior to the announcement. The $R^2$ for the OLS regression served as a measure of predictability in that characteristic. High values of $R^2$ indicated that a large proportion of variance in that characteristic can be explained by the prior year's statistic; hence that industry is relatively predictable in that criteria (Wholey & Brittain, 1989). Technological uncertainty was calculated as the average ratio of R & D and capital expenditure to total assets over the eight years prior to announcement. Greater expenditure represents greater uncertainty (Tosi et al., 1973). As there are no requirements that firms report these expenditures, the database may contain missing values for some firms. However, the measure of technological uncertainty was aggregated at the industry level and so no missing values were obtained.

### 4.2.4 Controls

**Relatedness**

In order to include potential synergy effects a measure of the product market relatedness was included in the analysis as a control variable. The effect of product market relatedness on acquisition performance is the subject of considerable debate in the literature. Rumelt (1974) noted that the performance of diversified firms differed according to their level of relatedness. It was argued that operational synergies would arise between firms with product market relatedness. More recently, evidence suggests that relatedness has little effect on performance (Lubatkin, 1987).

The majority of research on related acquisition in both the finance (e.g. Morck et al., 1990) and strategy literature (e.g. Rumelt, 1974) uses a simple dichotomous measure for relatedness. This measure classifies firms as related if they share at least one SIC code at the 4-digit level. However, this does not allow for variance in degree of relatedness. For this reason Lubatkin (1987) suggested that relatedness be measured as the ratio of common SIC codes to distinct SIC codes. Following Sirower (1997) this ratio was operationalized as the number of shared SIC codes at the 4-digit level divided by the number of distinct codes (including the shared code[s])[2]. For example, if the acquiring company operated in 6 different industries and the target in 4, of which 2 were common, the relatedness measure would be 2/8 = 0.25.

### Competing Bids

The existence of competing offers has been shown to increase the price paid for a target (Slusky & Caves, 1991; Varaiya, 1987). Therefore, a dichotomous variable was included in the analyses to account for this effect. This variable was coded 1 if the acquisition represented the sole bid and 2 if there were other offers made for the target. This data was obtained from the M & A database.

### Contested

The nature of the acquisition bid has been suggested to influence post-acquisition performance. Specifically, it has been argued that hostile bids might lead to post-acquisition integration problems or result in the departure of important human resources (Cannella & Hambrick, 1993; Walsh, 1988). Accordingly, a dichotomous variable was coded 1 for friendly acquisitions and 2 for hostile bids. This data was obtained from the M & A database.

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[2] This measure of relatedness may be influenced by the relative number of markets of the two firms. For example, a target firm that is only active in one market may be acquired by a firm in several markets. This would result in a low relatedness score. Therefore, the analyses described in Chapter 5 were replicated using the traditional dichotomous measure of relatedness described by Rumelt (1974). Similar results were obtained.

**Year of Offer**

In order to control for any potential macro-economic effects that may result from the date of the acquisition, the year in which the announcement was made was included as a categorical variable. This information was obtained from the announcement date as it appears in Mergerstat Review. This variable was coded as 1 for acquisitions in 1994 and 2 for those in 1995.

**Form of Payment**

It has been suggested that the form of financing used in an acquisition may contain a signal about the valuation of the acquiring firm's stock (Hansen, 1987). Specifically, cash offers suggest that management believes the acquiring firm's stock is under-valued, whereas equity financing suggests that they believe the acquiring firm's stock is over-valued. Empirical evidence indicates that equity financed tender offers perform worse in the long run than cash financed tenders (Agrawal et al., 1992). Therefore, method of payment was included in the analyses as a control variable.

Method of payment was measured as a dichotomous variable with 0 representing an all cash offer and 1 representing either an all share offer or a combination of cash and shares. This data was obtained from the M & A database.

**Tender**

A dichotomous variable was used to categorize acquisitions as subject to a tender offer or not. Those acquisitions for which a Form 14(D) was filed with the Securities and Exchange Commission were scored 1, otherwise they were scored 0.

### Target Prior Performance

The inefficient management hypothesis discussed in Chapter 2 implies that poorly performing companies are likely to be the subject of takeover offers (Ravenscraft & Scherer, 1987). If true, poorly performing companies are likely to be under-valued and premia larger. Therefore, the prior performance of the target company was included in the analysis as a potential source of acquisition premia. Prior performance was measured using target return on equity in the year prior to the announcement of the acquisition less the average return on equity for firms in the same 4-digit SIC. Data regarding the return on equity was obtained from Compustat.

### Acquiror Current Ratio

It is possible that higher levels of slack financial resources will lead managers to bid more for a target company. Therefore, the current ratio of the acquiring company was included in the analysis. This measure was taken from the Compustat database.

## *4.3 Post-Acquisition Performance of Acquiring Firms*

It was proposed in Chapter 3 that the payment of acquisition premia would be negatively related to subsequent performance by acquiring firms. These hypotheses (Hypotheses 6 and 7) are tested using an event study methodology. Event studies test the effect of a specific event on a dependent variable. In this part of the study the dependent variable was abnormal performance. Normal performance is defined as the performance one would expect in the absence of any effect of the event and is based on returns prior to the event. Regression analysis of the cumulative abnormal returns earned by the acquiring firm subsequent to announcement of the merger was used to identify factors correlated with this performance. This analysis sought to establish the effect of the acquisition announcement on firm performance.

### 4.3.1 Dependent Variables

The appropriate measure of organizational performance is an issue of debate in strategy research (Venkatraman & Ramanujam, 1986). The majority of research in the acquisitions field draws from the financial literature and focuses on returns to shareholders as the measure of performance (e.g. Morck et al., 1990; Slusky & Caves, 1991; Lubatkin, 1987; Sirower, 1997; Hayward & Hambrick, 1997). However, some strategy researchers have questioned the utility of market based measures of performance (e.g. Porter, 1987). Two major concerns are raised: first, share price movements reflect changes in expected future profit and dividends and not actual returns; and second, it is problematic to separate share price movements due to acquisition effects and those due to other events. Three alternative methods have been used to attempt to overcome these limitations of market based measures.

First, subjective ratings of experts have been used to judge the success of acquisitions. Bruton, Oviatt and White (1994) asked academics familiar with acquisitions to rate acquisition success. Similarly, Cannella and Hambrick (1993) had security analysts and executives of the acquiring firm give subjective judgements. However, these ratings are prone to hindsight bias as they are given after the acquisition is completed. They also severely limit the sample size that may be studied and require raters who are familiar with each case.

Second, subsequent divestiture has been used as a measure of the success or failure of an acquisition (Porter, 1987; Ravenscraft & Scherer, 1988), but this is a coarse measure that does not allow for a detailed analysis of performance.

The third alternative measure is the use of accounting returns (e.g. Shleifer & Vishny, 1991). This technique also suffers from the problem of acquisition performance being confounded with other events. Due to the periodic nature of accounting reporting it is especially difficult to isolate acquisition effects. In addition, accounting measures are also subject to accounting treatment variations between cases, thereby limiting the ability to compare between firms and across industries.

These alternative measures do not offer advantages over market measures and are subject to their own limitations. Therefore, I followed the majority of acquisition research in using stock market data to measure performance. Stock market data is readily available, objective and is easily comparable across firms. It also reflects the effects due to a specific event (such as an acquisition announcement) very rapidly, thereby allowing one to construct a measure that represents an immediate reaction to announcements. By focusing on the period around announcement, one is able to reduce the potential confounding of return due to announcement. Further, stock price movements have direct implications for shareholder wealth.

The use of share prices to measure performance is based on the assumption that share prices represent expected future cash flows and any event that causes those expectations to be revised will result in movement in the share price. This leads to two questions for the current study. First, how is the effect of an acquisition announcement separated from other events that may influence expectations? Second, when is the effect of the acquisition announcement to be measured (Magenheim & Mueller, 1988)?

In order to single out the effects of the acquisition announcement on share price, research focuses on the abnormal returns to a stock in the period following announcement. Abnormal returns are defined as the difference between expected returns and actual returns over a given time period. Expected returns are calculated from raw market returns in one of three ways (Brown & Warner, 1980, 1985).

Mean-adjusted returns are raw returns adjusted for the mean of the past performance of a firm. In this measure expected returns are the mean prior performance of the firm. In effect, this method assumes that in the absence of an acquisition announcement a firm's returns will be the same as the prior mean performance, and therefore any difference between pre- and post-announcement performance may be attributed to the event being studied.

Market-adjusted returns adjust raw returns for the movement in the market over the observation period. In this technique expected returns are the actual returns of a market portfolio. This is equivalent to a market model in which all firms have a systematic risk ($\beta$) of 1. This method contrasts the acquiring firm's stock performance with a control group (the market portfolio) and attributes any difference in returns to the event being studied.

Market-model returns are raw returns adjusted for the firm's past performance and response to market movements. This measure uses firm performance data over a time period prior to the period of study to estimate parameters that define the performance of the stock. These parameters are usually estimated using Ordinary Least Squares (OLS) regression and are used to generate expected returns for the stock based on market movements, as shown in Equation 4.3. The expected return ($E_R$) is calculated based on the estimates of a firm specific measure of sensitivity to market change ($\beta_i$) and average unsystematic returns ($\alpha_i$). Hence, this method generates expected returns from a combination of control group change (i.e. market returns, $R_{m,t}$) and the individual firm characteristics.

$$E_R = \alpha_i + \beta_i R_{m,t} \qquad [4.3]$$

Brown and Warner (1980, 1985) have investigated the performance of these three techniques in measuring abnormal stock performance on monthly and daily data. They found that the market-model technique performed well in identifying levels of abnormal performance in most conditions. The market-adjusted and mean-adjusted techniques also showed efficacy although they displayed less power than the market-models. These findings are supportive of the use of OLS estimates of parameters in calculating abnormal returns that is found in the strategy literature (e.g. Hambrick & Haywood, 1997; Sirower, 1997). In addition, this technique allows for direct comparison with previous research in this area (i.e. Hayward & Hambrick, 1997). Therefore, I chose to use the market model technique[3].

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[3] Some strategy researchers have expressed reservations about the use of a market-model technique to measure performance due to the potential instability of the parameter estimates derived (e.g. Cannella & Hambrick, 1993). In particular, Magenheim & Mueller (1988) showed that the parameter estimates are susceptible to the estimation period used to calculate them. The authors demonstrated that the choice of estimation period may alter the resulting levels of abnormal performance and distort findings of the effect of acquisitions on subsequent performance. For this reason I performed duplicate analyses using a market adjusted approach in which abnormal performance was defined as the difference between firm returns and

Abnormal returns for firm i on day t ($A_{i,t}$) are the difference between actual and expected returns and were calculated using Equation 4.4:

$$A_{i,t} = R_{i,t} - \alpha_i - \beta_i R_{m,t} \qquad [4.4]$$

where:

$R_{i,t}$ = return for stock i on day t

$R_{m,t}$ = return for the market portfolio on day t

$\alpha_i$, $\beta_i$ = OLS parameters derived from the estimation period.

The derived parameters define both the firm specific movement and the way in which the firm stock price reacts to market change.

Market models most commonly use some form of equally weighted index (Brown & Warner, 1985). As the sample in this study is composed of companies trading on the three major U.S. exchanges, the CRSP equally weighted market index was used. This index incorporates firms on each of the exchanges. Stock price and market index information used to calculate abnormal returns was obtained from the CRSP database.

The cumulative abnormal return ($CAR_{i:t1,t2}$) represents the performance of stock i from time $t_1$ to time $t_2$. Its calculation is shown in Equation 4.5.

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the CRSP equally weighted market index over the period of interest. Results were substantially similar to those reported.

$$CAR_{i:t1,t2} = \Sigma_{t1:t2} A_{i,t} \qquad [4.5]$$

### Short-term Performance

The choice of time period in which to study response is an important factor in an event study. As the purpose of this research was to identify responses to a specific event, the announcement of the price of an acquisition bid, the observation period was based around the announcement date as identified in the Mergers and Acquisitions database. As discussed in Chapter 3, short-term CAR was measured five days either side of the announcement date[4].

As noted above, the choice of estimation period is arbitrary and may influence the parameter estimates obtained. In order to minimize this risk, parameters were estimated over the period immediately preceding the event window. Parameters were derived from OLS regression of daily return data for each acquiring firm from 230 to 30 trading days prior to the announcement of the acquisition bid.

### Long-term Performance

In order to test the hypothesized effects of acquisition premia on longer term performance, two other measures of cumulative abnormal returns based on monthly returns were obtained. First, abnormal returns were measured over the 12 month period immediately after announcement of the acquisition. This was calculated using Equations 4.3 and 4.4. The parameters used to estimate expected returns were derived from OLS regression of firm returns on market returns for the 48 month period prior to announcement.

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[4] Short-term performance was also calculated for the time periods 1 day prior announcement to 1 day after and 3 days either side of the announcement. These were both positively correlated with CAR (5,-5) ($r = 0.564$ and $r = 0.615$ respectively, both $p < 0.001$). The analyses reported in Chapter 5 were repeated using these measures and very similar results obtained.

A second measure of long term performance was calculated based on the abnormal returns in the 24 months subsequent to announcement. This score was calculated using Equations 4.3 and 4.4 and used the same parameter estimates as those for the 12 month returns.

Data for both long term measures was obtained from the CRSP database.

# CHAPTER 5: RESULTS

In this chapter the results of analyses conducted to test the hypotheses developed in Chapter 3 are described. The chapter begins by discussing the development of the uncertainty scales used in subsequent analyses. The characteristics of the sample are then addressed and the current sample compared to those of previous research. The hypothesis testing analysis is performed in three sections. Section 5.3 uses a cross-sectional design to investigate the determinants of premia in the acquisition announcements in the sample studied. In Section 5.4 the second set of tests seeks to establish the effect of uncertainty on the impact of these determinants on premia. In doing so these analyses aim to validate the arguments made in Chapter 3 regarding the importance of valuation processes. The final section of analyses uses an event study design to test the performance implications of acquisition premia for the acquiring firm's stockholders.

## *5.1 Scale Development*

### 5.1.1 Uncertainty

As discussed in Section 4.2.2, target industry uncertainty was measured by calculating the $R^2$ of the OLS regression of two industry characteristics (industry sales and profits before tax) on those characteristics lagged one year and from the ratio of research and development and capital expenditure to total assets. Following Bourgeois (1985) these three measures were reduced to one measure of technological uncertainty and one of commercial uncertainty. In addition to unreported principal components analysis indicating that the industry sales and profit before tax measures may be reduced to a single measure, the correlation matrix for the three scores shows sales volatility and income volatility are positively and significantly correlated. This correlation matrix is shown in Table 5.1. There is no significant relationship between technological uncertainty and the other measures. Therefore, sales and income volatility were combined to form a single measure, commercial uncertainty. This measure was calculated as the sum of the two prior measures.

| | Sales Volatility | Income Volatility |
|---|---|---|
| Income Volatility | 0.392*** | 1.000 |
| Technological Uncertainty | 0.099 | -0.003 |

* p<0.10, ** p<0.05, *** p<0.01

Table 5.1: Correlation Matrix of Industry Uncertainty Measures

The scales developed above provide a continuous measure of the relative uncertainty of target firm industries. However, for the purposes of some of the subsequent analysis it was necessary to develop a categorical measure of relative uncertainty. This was achieved by taking a median split of the sample. Each target firm was classified on the basis of whether the primary industry in which it operated displayed predictability greater or less than the median on each of the two uncertainty measures.

### 5.1.2 Expertise

Recall from Chapter 3 that expertise was defined as arising through training and experience (Spence & Brucks, 1997). As a result, measures of both functional and educational background were matched against the sources of environmental uncertainty to obtain scores for CEO expertise as described in Section 4.2.3.

The two measures of expertise were highly correlated ($r^2 = 0.60$, $p < 0.01$) and so a composite variable, expertise, was created as the sum of the educational and functional expertise measures.

### *5.2 Descriptive Statistics*

The sample used in this study is composed of 135 acquisition announcements over a two year period. Summary statistics describing the sample are presented in Table 5.2. A full listing including the acquiror and target, date and price of the acquisition is provided in Appendix A.

The size of acquisition bids ranged from $100 million (the lower bound of the selection criteria) to $19 billion. The average bid was $1.2 billion, as shown in Table 5.2. These are large firms managed by professional managers subject to considerable market scrutiny. Further, the magnitude of the bids indicate that variations in the size of acquisition premia will lead to differences in the price offered of a considerable magnitude. The size of the announcements also suggests that they constitute a significant investment by the acquiror and that they are likely to impact future performance. Therefore, one may anticipate that senior management, and specifically the CEO will be involved in the decision process leading to the bid (Hapeslagh & Jemison, 1991).

Two descriptive statistics in Table 5.2 are worthy of note at this point. First, the mean premium was 32%, meaning that on average acquiring firms paid 1.32 times the existing market value of a firm in order to acquire it. This is consistent with prior research. Jensen (1993) reported an average premium paid for acquisitions between 1976 and 1990 of 41%. In research conducted on more recent samples average premia have been of a similar magnitude. Hayward & Hambrick (1997) reported average premia of 49% and Sirower (1997) reported 30%.

| Variable | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1 Acquiror liquidity | 1.79 | 1.30 | | | | | | | |
| 2 Acquiror prior performance | 0.06 | 0.17 | -0.10 | | | | | | |
| 3 Commercial uncertainty | 1.05 | 0.38 | 0.01 | 0.11 | | | | | |
| 4 Contested | 1.02 | 0.12 | -0.01 | 0.03 | 0.04 | | | | |
| 5 Multiple bids | 1.02 | 0.12 | -0.08 | -0.03 | -0.28*** | -0.02 | | | |
| 6 Payment method | 0.75 | 0.43 | 0.08 | -0.09 | -0.02 | -0.07 | -0.07 | | |
| 7 Acquisition premium | 0.32 | 0.34 | 0.08 | 0.24*** | 0.06 | 0.03 | 0.06 | -0.13 | |
| 8 Relative pay | 1.76 | 0.83 | -0.10 | -0.02 | 0.01 | -0.03 | 0.03 | -0.23*** | 0.06 |
| 9 Relatedness | 0.27 | 0.34 | 0.07 | -0.09 | 0.06 | -0.08 | -0.03 | 0.23*** | -0.11 |
| 10 Target prior performance | 0.00 | 0.31 | 0.02 | 0.12 | -0.10 | 0.04 | 0.04 | -0.15* | -0.17* |
| 11 Tender | 1.85 | 0.36 | -0.01 | -0.12 | 0.15* | -0.29*** | -0.29*** | 0.51*** | -0.07 |
| 12 Technological uncertainty | 0.06 | 0.06 | 0.36*** | 0.04 | 0.05 | 0.09 | 0.01 | -0.05 | 0.22** |
| 13 Year | 1.59 | 0.49 | -0.01 | -0.08 | 0.01 | 0.01 | -0.02 | -0.02 | -0.02 |
| 14 CAR (-5,5) | -0.02 | 0.07 | -0.32*** | 0.13 | 0.05 | 0.15* | 0.06 | 0.06 | -0.06 |
| 15 CAR (0,12) | -0.05 | 0.35 | -0.18** | 0.09 | 0.08 | 0.04 | 0.05 | -0.10 | -0.03 |
| 16 CAR (0,24) | -0.08 | 0.53 | -0.15* | 0.11 | 0.01 | 0.04 | 0.05 | -0.14 | -0.02 |
| 17 Price ($ millions) | 1203.02 | 2752.72 | -0.05 | 0.09 | 0.04 | 0.02 | 0.04 | 0.05 | -0.04 |
| 18 Expertise | 0.62 | 0.40 | -0.15 | -0.02 | 0.30*** | -0.12 | -0.01 | -0.17* | 0.22** |

| | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 Relatedness | -0.05 | | | | | | | | | |
| 10 Target prior performance | 0.23*** | -0.06 | | | | | | | | |
| 11 Tender | -0.07 | 0.11 | 0.11 | | | | | | | |
| 12 Technological uncertainty | -0.02 | 0.08 | -0.02 | -0.18** | | | | | | |
| 13 Year | 0.08 | 0.06 | 0.03 | 0.10 | 0.03 | | | | | |
| 14 CAR (-5,5) | 0.03 | 0.04 | -0.01 | -0.195** | -0.15* | -0.19** | | | | |
| 15 CAR (0,12) | -0.10 | 0.17** | -0.20** | -0.21** | -0.14 | -0.09 | 0.19** | | | |
| 16 CAR (0,24) | -0.06 | 0.12 | -0.17* | -0.20** | -0.24*** | 0.03 | 0.11 | 0.835*** | | |
| 17 Price | -0.08 | 0.19** | -0.06 | 0.17** | 0.06 | 0.13 | 0.15* | 0.16* | 0.06 | |
| 18 Expertise | 0.06 - | 0.13 | -0.09 | -0.12 | 0.01 | 0.03 | -0.15 | -0.11 | -0.04 | -0.00 |

* p<0.10, ** p<0.05, *** p<0.01

Table 5.2: Correlation Matrix and Summary Statistics

Second, the average cumulative abnormal return in the period five days either side of the announcement date for acquiring firms in the current sample was –2.08%. This is very similar to results reported in other published samples. Recall from Chapter 2 that Bradley et al. (1988) reported average abnormal returns of -2.9% for the ten day period around announcement, Morck et al. (1990) found abnormal returns of -1.8% and Sirower (1997) reported abnormal returns of -2.3%.

Further, the average abnormal returns for the year after announcement of -5.4% observed in this sample is consistent with those reported in the samples reviewed in Jensen and Ruback (1983). The seven studies listed in their review had an average negative abnormal return of -5.5%.

In the two year period following the announcement the average cumulative abnormal returns found in this study were even lower. The average of -8.15% is comparable to the 10% loss found by Agrawal et al. (1992) over a five year period.

These descriptive statistics indicate that the current sample is consistent with those of existing reported studies and show similar characteristics in terms of the four dependent variables.

### *5.3 Determinants of Acquisition Premia*

The correlation matrix shown in Table 5.2 indicates that there is some relationship between the proposed sources of perceived competence (that is, acquiror prior performance, relative pay and expertise) and acquisition premia. However, in order to describe these relationships in more detail and provide an empirical validation of the model described in Chapter 3, further analysis was performed using Ordinary Least Squares

(OLS) regression techniques. The first series of hypotheses regarding the source of acquisition premia were tested by estimating two regression models, shown in Table 5.3.

Model 1 regresses the size of acquisition premium on several variables that were identified in the literature as potentially related to the price a company would pay to acquire another firm using OLS regression. These control variables were entered into Model 1 simultaneously. As can be seen from Table 5.3, the prior performance of the target firm in the year prior to the acquisition announcement was negatively related to the size of the acquisition premium. That is, in the current sample acquirors paid a higher premium to buy a target that had performed poorly in the recent past. This finding suggests that poor current management may be a motivating factor in acquisitions. Target under-performance may lead managers to believe that the target is under-valued because current management is not effectively managing the assets. This finding is consistent with those of Ravenscraft and Scherer (1987) who reported that lines of business subject to tender offers perform worse than a comparable control group. These findings are also consistent with a contrarian approach to investing in which acquirors bid for under-performing firms in the belief that performance will improve. This issue is beyond the scope of this paper and the study design does not allow one to distinguish between these explanations.

There is no indication that product market relatedness leads to a higher acquisition premia. It would appear that, in the current sample, acquirors do not look to common product industry presence as a source of potential synergy. This does not preclude managers basing estimates of target value on potential synergies, for, as noted in Chapter 2, synergy is the most commonly cited reason for mergers and acquisitions (Walter & Barney, 1990). However, the measure of relatedness used in this study may be too coarse

Dependent Variable: Acquisition Premium

| N = 135 | Model 1 | Model 2 |
|---|---|---|
| Constant | 0.342<br>(0.567) | -0.035<br>(0.508) |
| Acquiror current ratio | 0.026<br>(0.023) | 0.018<br>(0.024) |
| Contested | 0.166<br>(0.263) | 0.188<br>(0.255) |
| Multiple bidders | -0.172<br>(0.261) | -0.116<br>(0.257) |
| Method of payment | -0.127<br>(0.085) | -0.128<br>(0.084) |
| Relatedness | -0.106<br>(0.091) | -0.097<br>(0.089) |
| Tender offer | 0.044<br>(0.109) | 0.130<br>(0.109) |
| Target prior performance | -0.228**<br>(0.099) | -0.296***<br>(0.100) |
| Year | -0.011<br>(0.062) | -0.009<br>(0.060) |
| Acquiror prior performance | | 0.516***<br>(0.180) |
| Relative pay | | 0.043<br>(0.037) |
| Technological uncertainty | | 1.166**<br>(0.534) |
| Commercial uncertainty | | -0.032<br>(0.083) |
| $R^2$ | 0.080 | 0.180** |

* $p<0.10$, ** $p<0.05$, *** $p<0.01$, standard errors in parentheses

Table 5.3: OLS Regression Model Coefficients: Determinants Of Acquisition Premia

to differentiate the potential for synergies to arise. This issue is discussed further in Chapter 6.

Overall, Model 1 does not explain a significant proportion of the variance in the size of the acquisition premia. In order to determine the source of this variance, in Model 2 the variables hypothesized in Chapter 3 to be linked to valuation processes were added. This was a two stage process in which the control variables were added as a block and the independent variables were added as a second block. The addition of the relative pay of the CEO, the prior performance of the acquiring firm and the commercial and technological predictability resulted in a significant increase in $R^2$ over Model 1 ($F = 3.65$, $p < 0.01$). This model explains a significant proportion of variance in the dependent variable of acquisition premium, with an $R^2$ of 0.18. It was used to test the first series of hypotheses.

*Hypothesis 1.*

> A CEO's compensation relative to that of the next highest paid officer in the firm will be positively related to the size of acquisition premium in a bid.

In Model 2 the beta coefficient of the independent variable relative pay is positive but not significantly different from 0. Therefore, Hypothesis 1 is not supported. As the ratio of the cash compensation to that of the next highest paid officer of the company increases, the size of the acquisition premium increases, although this effect is not significant. This finding fails to replicate those of Hayward and Hambrick (1997).

*Hypothesis 2.*

> The level of expertise of the CEO of the acquiring firm, as defined by the match between functional and educational background with the source of uncertainty in the target industry, will be positively related to the size of premium in an acquisition announcement.

Hypothesis 2 was also tested using regression analysis. However, data on educational background and functional experience was not available for all CEOs in the sample. Therefore, empirical validation of this hypothesis is limited to the 95 cases for which such data was obtained. This sub-sample has a similar mean premium (35% compared to 32%). The average purchase price was $1393 million, similar to that of the full sample mean of $1203 million.

To test the hypothesis an OLS regression model was estimated for the dependent variable acquisition premium on the control variables, relative pay, acquiror prior performance and CEO expertise. This model is presented in Table 5.4.

Table 5.4 shows that the results of Model 3 are similar to those of Model 2. The prior performance of the target is significantly and negatively related to the size of the acquisition premium announced. The prior performance of the acquiring firm is positively and significantly related to the premium, as in Model 2. Again, the relative compensation of the CEO is not significantly related to the premium offered. Although the beta coefficient is positive, it is not possible to reject the null hypothesis that it is equal to 0 ($t = 0.905$, $p = \text{ns}$).

Dependent Variable: Acquisition Premium

| N = 95 | Model 3 |
|---|---|
| Constant | -0.288<br>(0.585) |
| Acquiror current ratio | 0.027<br>(0.040) |
| Contested | 0.345<br>(0.279) |
| Method of payment | -0.161<br>(0.101) |
| Multiple bidders | -0.047<br>(0.274) |
| Relatedness | -0.045<br>(0.126) |
| Tender offer | 0.162<br>(0.125) |
| Target prior performance | -0.422***<br>(0.158) |
| Year | -0.070<br>(0.080) |
| Acquiror prior performance | 0.581***<br>(0.220) |
| Relative pay | 0.039<br>(0.043) |
| Expertise | 0.195**<br>(0.096) |
| $R^2$ | 0.218** |

* $p<0.10$, ** $p<0.05$, *** $p<0.01$, standard errors in parentheses

Table 5.4: OLS Regression Model Coefficients: Acquisition Premia And Expertise

Model 3 provides support for Hypothesis 2 [5]. The regression coefficient of the expertise variable is positive and significantly greater than 0. One may conclude that CEO's who had more relevant expertise as measured by the match between experience and source of uncertainty faced in the target industry offer higher premia when acquiring other companies.

*Hypothesis 3.*

> An acquiring firm's returns in the year prior to announcement of an acquisition will be positively related to the size of the premium in the bid.

Model 2 on page 78 provides support for Hypothesis 3 and replicates the findings of Bugeja and Walter (1995) and Hayward and Hambrick (1997) in that acquiror prior performance is positively related to the amount bid in an acquisition announcement. The beta coefficient of the acquiror's prior performance variable is positive and significant. Firms reporting higher prior performance as reflected in return on equity in the year prior to the announcement bid more for targets. The inclusion of the acquiror's current ratio should account for any increase in premia due to the effect of liquidity. Any systematic effect due to the acquiror's slack resources leading to an ability to pay a higher price therefore should be removed. Thus, these results suggest it is the non-financial aspects of positive prior performance that lead firms to pay higher premia.

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[5] As noted above not all cases were included in Model 3 due to missing data. When conducting analyses on cases with missing variable data, one method of including these cases in the sample is to estimate the value of the missing variables. One method of estimating this data is to replace missing variables with the mean score for the sample (Stevens, 1996). In order to test the hypothesis on the full data set the analysis was repeated using mean values for the missing data points. The estimated model had parameters that are very similar to those of Model 3. The coefficients of the control variables acquiror current ratio and target prior performance were both significantly different from 0 ( 0.041 [0.022], $p < 0.01$ and –0.281 [0.097], $p < 0.01$ respectively), as were the coefficients for acquiror prior performance (0.568 [0.173], $p < 0.01$) and expertise (0.205 [0.087], $p < 0.05$). The model had an $R^2$ of 0.187 ($p < 0.01$).

### 5.3.1 Discussion

The findings presented above clearly indicate that the size of acquisition premia offered in the current sample were related to the prior performance of the acquiring firm and the level of expertise in the target industry of the acquiring CEO. The acquisition premium represents the acquiring firm's estimate of the future value of the target firm assets above that reflected in the current market value. Thus, acquiring firms' estimates of the value they can extract from targets were based not only on economic factors such as product market relatedness or existing target under-performance, but were also related to the past performance and personal knowledge of the CEO. This is strongly indicative that competence of the CEO was important in determining estimates of the future performance of the target firm.

The data did not support the importance of relative pay on estimates of value. Two explanations can be offered for this. First, relative pay was calculated as the ratio of the cash compensation of the CEO to that of the next highest paid officer of the firm. Thus, this variable does not incorporate the contingent compensation such as stock options that are observed in many large firms. However, to include such compensation would confound the relative pay of the CEO with the prior performance of the acquiring firm. Second, Hayward and Hambrick (1997) propose that the relative pay of a manager reflects the more stable aspect of confidence, however, it may represent the relative power or influence of the CEO (Zajac & Westphal, 1995).

### *5.4 The Effect of Uncertainty on Acquisition Valuations*

*Hypothesis 4.*

The level of uncertainty in the target industry will be positively related to the size of the acquisition premium.

Model 2 on page 78 provided partial support for Hypothesis 4. Recall from Chapter 4 that the level of uncertainty in the target industry was operationalized in two ways: predictability of commercial factors and technological uncertainty. These two measures were included in the Model 2 regression shown in Table 5.3. In this model the beta coefficient of technological uncertainty was positive and significantly larger than 0. Acquiring firms paid higher premia to obtain firms in industries characterized by greater technological uncertainty. However, there was no support for the impact of commercial predictability on acquisition premia. The coefficient of the commercial uncertainty variable was not significantly different from 0.

In Chapter 3 it was argued that the main effect of uncertainty on bidding behaviour was the result of the interaction between judgement processes and uncertainty. Specifically, it was proposed that the relationship between expertise, relative pay and prior performance would be more pronounced as uncertainty increases. In order to test these hypotheses (Hypotheses 5a and 5b) the sample was split into sub-samples. First, each target firm was characterized as either above or below the median level of commercial uncertainty. On this basis the sample was divided into cases in which the target firm operates primarily in a relatively predictable industry and cases in which the target operates in a relatively unpredictable industry. OLS regression models were then estimated for each sub-sample. These Models, 4 and 5, are shown in Table 5.5. Similarly, the sample was split on the median of technological uncertainty and regression models estimated for each (shown as Models 6 and 7 in Table 5.6).

*Hypothesis 5a.*

> Measures of perceived competence, namely relative pay, previous performance and expertise, will not be related to the size of the acquisition premia bid for targets in industries in which change is relatively predictable.

*Hypothesis 5b.*

> Measures of perceived competence, namely relative pay, previous performance and expertise, will be positively and significantly related to the size of the acquisition premia bid for targets in industries in which change is relatively unpredictable.

The four models presented in Tables 5.5 and 5.6 provide partial support for Hypotheses 5a and 5b regarding the moderating effect of uncertainty on managerial characteristics. In industries in which the predictability of sales and profits were relatively high, individual managerial characteristics were not significantly related to the amount bid for a target (Model 4), thereby providing support for Hypothesis 5a. Similarly, Model 6 shows that the variables were not able to predict a significant proportion of variance in acquisition announcements in which the target operated in a primary industry in the lower half of the sample in terms of technological uncertainty ($R^2 = 0.144$, p = ns).

Dependent Variable: Acquisition Premium

| | Model 4 | Model 5 |
|---|---|---|
| Commercial uncertainty | **low** | **high** |
| N | **50** | **45** |
| Constant | 0.273<br>(0.474) | -0.357<br>(0.343) |
| Acquiror current ratio | 0.006<br>(0.076) | -0.018<br>(0.060) |
| Method of payment | -0.062<br>(0.108) | -0.429**<br>(0.187) |
| Relatedness | -0.117<br>(0.151) | 0.226<br>(0.227) |
| Tender offer | 0.041<br>(0.167) | 0.453**<br>(0.198) |
| Target prior performance | -0.337*<br>(0.168) | -0.159<br>(0.352) |
| Year | -0.086<br>(0.099) | -0.120<br>(0.122) |
| Acquiror prior performance | 0.027<br>(0.307) | 1.231***<br>(0.314) |
| Relative pay | 0.025<br>(0.048) | 0.067<br>(0.078) |
| Expertise | 0.167<br>(0.108) | 0.514***<br>(0.190) |
| $R^2$ | 0.230 | 0.415** |

*** p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses**

**Table 5.5: OLS Regression Model Coefficients: Determinants Of Acquisition Premia By Commercial Uncertainty**

Dependent Variable: Acquisition Premium

| | Model 6 | Model 7 |
|---|---|---|
| Technological uncertainty | **low** | **high** |
| N | **51** | **44** |
| Constant | 0.076 | 0.153 |
| | (0.404) | (0.332) |
| Acquiror current ratio | 0.046 | -0.009 |
| | (0.058) | (0.062) |
| Method of payment | -0.138 | -0.097 |
| | (0.149) | (0.136) |
| Relatedness | 0.141 | -0.199 |
| | (0.224) | (0.154) |
| Tender offer | 0.247 | 0.084 |
| | (0.199) | (0.134) |
| Target prior performance | -0.201 | -0.511** |
| | (0.281) | (0.188) |
| Year | -0.172 | -0.001 |
| | (0.124) | (0.107) |
| Acquiror prior performance | -0.318 | 0.637*** |
| | (0.624) | (0.224) |
| Relative pay | -0.028 | 0.041 |
| | (0.078) | (0.050) |
| Expertise | 0.193 | 0.183 |
| | (0.146) | (0.128) |
| $R^2$ | 0.144 | 0.389** |

* p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses

Table 5.6: OLS Regression Model Coefficients: Determinants Of Acquisition Premia By Technological Uncertainty

However, when the target firm was in an industry in which these commercial factors were less predictable, acquiror prior performance and expertise were significantly related to premia bid (1.231 [0.314], $p < 0.01$ and 0.514 [0.190], $p < 0.01$ respectively). In Model 7 the target industry had high levels of research and development and capital expenditure relative to total assets (an indicator of technological uncertainty) and acquiror prior performance was significantly and positively related to valuations (0.637 [0.224], $p < 0.01$). CEO expertise had a positive beta coefficient, however, it was not significantly different from zero ($t = 1.431$, $p = 0.16$). Thus, Hypothesis 5b was partially supported in that the measures of perceived competence that were found to influence acquisition premia in Models 2 and 3 were related to premia under conditions of relatively higher uncertainty.

### 5.4.1 Discussion

The second set of hypotheses were concerned with the effect of uncertainty on the valuation process. The results showed that the managers paid a higher premium for targets in industries characterized by technological unpredictability. The level of commercial unpredictability was not significantly related to the premium offered. It was argued in Chapter 3 that this occurs because the impact of judgemental biases will amplify as uncertainty increases. This is because managers rely more on judgement under conditions of uncertainty, leading to a stronger relationship between relative pay, prior performance and expertise, and premium bid. The tests of Hypotheses 5a and 5b supported this argument, showing that the measures of perceived competence were related to acquisition premia when the predictability was low, but not when the target industry was predictable. This suggests that the variance in target valuation occurred due to judgement processes that were used in response to uncertainty, and were not a constant added to all valuations. This is an important distinction to make as it allows one to differentiate between an explanation based on 'hubris' or self-confidence in which the premium represents a confidence factor that is added to all estimates of performance, and one in which premia result from a cognitive bias, the illusion of control, in which simplifying processes lead to distortion in estimates under certain circumstances. Specifically, perceived competence was important in determining acquisition premia when uncertainty was high, but was not used as an indicator of future performance when uncertainty was relatively lower.

Thus far, the data support the model developed in Chapter 3 in which acquisition valuations were proposed to be a special case of the over-confidence bias. The finding that the personal knowledge and prior performance of the senior managers were significantly related to the estimates of value demonstrates that managers believed that they were able to influence post-acquisition performance. The moderating effect of uncertainty provides further evidence that acquisition valuations are influenced by judgement processes.

### *5.5 Performance Effects*

*Hypotheses 6a – 6c.*

The average abnormal returns to acquiring firms in the 11 day period around announcement will be negative.

The average abnormal returns to acquiring firms in the 12 month period following announcement will be negative.

The average abnormal returns to acquiring firms in the 24 month period following announcement will be negative.

Table 5.7 presents the average cumulative abnormal returns for the full sample. The average abnormal returns for the period from 5 days prior to 5 days after announcement was -2.08%. As discussed in Section 5.2 this average performance is similar to those reported in other samples. This is significantly below normal returns ($t = -3.80$, $p < 0.01$). Following Brown and Warner (1985) the test statistic was calculated as the ratio of the cumulative mean abnormal return to estimated standard deviation. Further, 84 of the 135 firms (62%) in the sample earned a negative abnormal return in this time period. This proportion is consistent with prior research. Bradley et al. (1988) reported 65% of firms in their sample earned negative returns at announcement. Similarly, Morck et al. (1990) found negative returns in 63% of the firms they studied and Sirower (1997) in 65% of firms. A binomial test showed that there are more firms earning negative abnormal returns than would be expected by chance (i.e. 50% of firms earn negative abnormal returns) ($z = 2.915$, $p < 0.01$). Therefore, the analysis provided support for Hypothesis 6a.

As can be seen in Table 5.7, the average 12 month abnormal return was -5.40%. Although the proportion of firms earning negative returns was not significantly different from that expected by chance, average cumulative abnormal returns remain negative and significantly less than 0. Therefore, Hypothesis 6b was supported. Similarly, the average cumulative abnormal returns for acquiring firms in the 24 month period after the acquisition was announced was significantly less than 0, supporting Hypothesis 6c.

|  | 10-day CAR | 12-month CAR | 24-month CAR |
|---|---|---|---|
| Mean | -2.08% | -5.40% | -8.15% |
| S.D. | 0.07 | 0.35 | 0.53 |
| t-statistic | -3.08*** | -1.80** | -1.79** |
| % negative | 62.20*** | 51.10 | 44.40 |

* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table 5.7: Cumulative Abnormal Returns To Acquiring Firms

*Hypothesis 7a.*

> The size of acquisition premium paid is negatively related to the performance of the acquiring company in the 11 day period around the announcement of the bid.

Hypothesis 7a was tested by regressing the cumulative abnormal returns from 5 days prior to 5 days subsequent to the announcement of the acquisition on the control variables in the first block and then adding the premium as an independent variable in the second block. These OLS regression models are presented in Table 5.8. As can be seen the addition of the acquisition premium did not significantly improve the proportion of variance explained ($F = 0.293$, $p = ns$). In addition the beta coefficient was not significantly different from 0. Therefore, one could not reject the null hypothesis that the size of acquisition premium is not related to short term performance.

*Hypothesis 7b.*

> The size of acquisition premium paid is negatively related to the performance of the acquiring company in the 12 month period following the announcement of the bid.

Dependent Variable: Cumulative Abnormal Returns (-5, 5)

| N = 135 | Model 8 | Model 9 |
|---|---|---|
| Constant | 0.039 | 0.043 |
|  | (0.097) | (0.098) |
| Acquiror current ratio | -0.018*** | -0.017*** |
|  | (0.004) | (0.005) |
| Contested | 0.074 | 0.076 |
|  | (0.051) | (0.051) |
| Multiple bidders | -0.008 | -0.010 |
|  | (0.050) | (0.050) |
| Method of payment | -0.002 | -0.003 |
|  | (0.018) | (0.017) |
| Relatedness | 0.022 | 0.021 |
|  | (0.018) | (0.018) |
| Tender offer | -0.032 | -0.031 |
|  | (0.021) | (0.018) |
| Target prior performance | 0.004 | 0.002 |
|  | (0.019) | (0.020) |
| Year | -0.027** | -0.027** |
|  | (0.012) | (0.012) |
| Acquisition premium |  | -0.009 |
|  |  | (0.017) |
| $R^2$ | 0.190*** | 0.192*** |

* $p<0.10$, ** $p<0.05$, *** $p<0.01$, standard errors in parentheses

Table 5.8: OLS Regression Model Coefficients: Effect Of Acquisition Premia On Short-Term Cumulative Abnormal Returns

Hypothesis 7b was tested in the same way as Hypothesis 7a. The estimated models are shown in Table 5.9 and indicate that the acquisition premium did not significantly increase the proportion of variance explained in the model ($F = 0.192$, $p$ = ns). One could not reject the hypothesis that the beta coefficient for acquisition premium is equal to 0, therefore Hypothesis 7b also lacked empirical support.

Dependent Variable: Cumulative Abnormal Returns (0,12)

| N = 135 | Model 10 | Model 11 |
|---|---|---|
| Constant | 0.395<br>(0.510) | 0.405<br>(0.512) |
| Acquiror current ratio | -0.051**<br>(0.023) | -0.050**<br>(0.023) |
| Contested | 0.052<br>(0.260) | 0.059<br>(0.262) |
| Multiple bidders | -0.023<br>(0.259) | -0.029<br>(0.260) |
| Method of payment | -0.069<br>(0.084) | -0.074<br>(0.085) |
| Relatedness | 0.233**<br>(0.090) | 0.229**<br>(0.091) |
| Tender offer | -0.167<br>(0.110) | -0.164<br>(0.110) |
| Target prior performance | -0.189*<br>(0.098) | -0.198*<br>(0.101) |
| Year | -0.056<br>(0.061) | -0.057<br>(0.062) |
| Acquisition premium | | -0.039<br>(0.089) |
| $R^2$ | 0.156*** | 0.157** |

* p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses

Table 5.9: OLS Regression Model Coefficients: Effect Of Acquisition Premia On 12-Month Cumulative Abnormal Returns

*Hypothesis 7c.*

The size of acquisition premium paid is negatively related to the performance of the acquiring company in the 24 month period following the announcement of the bid.

OLS regression was used to model the relationship between acquisition premia and 24-month cumulative abnormal returns. Model 12 represent the first block in which control variables are added, Model 13 the second block with the addition of the acquisition premium offered. The results of this analysis on cumulative abnormal returns for the 24 months after the acquisition was announced (shown in Table 5.10) were consistent with those for shorter period returns. The beta coefficient of the acquisition premium variable was not significantly different from 0 and the addition of this variable did not significantly improve the variance explained by the model (F = 0.163, p = ns). Therefore, Hypothesis 7c was not supported.

### 5.5.1 Discussion

The analyses conducted above did not support the hypothesized relationship between acquisition premia and abnormal returns. Although the beta coefficients were negative for each performance period, they did not differ significantly from zero. This finding is inconsistent with previous research on acquisition premia. Hayward and Hambrick (1997) found a significant, negative relationship between the size of acquisition premia and 1 year returns, although they found an insignificant positive relationship between premia and immediate returns. Sirower (1997) reports significant, negative

Dependent Variable: Cumulative Abnormal Returns (0,24)

| N = 135 | Model 12 | Model 13 |
|---|---|---|
| Constant | 0.390<br>(0.792) | 0.405<br>(0.796) |
| Acquiror current ratio | -0.062*<br>(0.036) | -0.061*<br>(0.036) |
| Contested | 0.037<br>(0.405) | 0.047<br>(0.407) |
| Multiple bidders | -0.002<br>(0.402) | -0.011<br>(0.404) |
| Method of payment | -0.149<br>(0.130) | -0.156<br>(0.132) |
| Relatedness | 0.263*<br>(0.140) | 0.257*<br>(0.141) |
| Tender offer | -0.216<br>(0.170) | -0.213<br>(0.171) |
| Target prior performance | -0.265*<br>(0.153) | -0.278*<br>(0.157) |
| Year | 0.028<br>(0.095) | 0.028<br>(0.096) |
| Acquisition premium | | -0.056<br>(0.139) |
| $R^2$ | 0.116* | 0.117* |

* $p<0.10$, ** $p<0.05$, *** $p<0.01$, standard errors in parentheses

Table 5.10: OLS Regression Model Coefficients: Effect Of Acquisition Premia On 24-Month Cumulative Abnormal Returns

relationships between premia and performance over several time periods ranging from 2 days to 4 years after announcement. Consistent with Hayward and Hambrick (1997), the effect of premia on returns in Sirower's sample was stronger over longer time periods. Sirower (1997) used a measure of acquisition premia that is consistent with that used in this research. However, Hayward and Hambrick (1997) based their measure of premia on stock prices 30 days prior to announcement. As noted in Chapter 4, the above analyses were duplicated using this measure. The results of these regression models were similar to those reported above with one exception. The beta coefficient of acquisition premia was significantly less than zero in the CAR (-5,5) model ($\beta = -0.03$ [0.01], $p < 0.10$) when the acquisition premium was calculated using an unaffected target price 30 days prior to announcement. Therefore, the immediate stock market reaction to announcements was worse the higher the premium offered when premium was measured in this way. This was supportive of Hypothesis 7a. However, the CAR (0,12) and CAR (0,24) models were similar to those shown above in that the premium offered was not related to performance. These results were also inconsistent with previous research that shows the effect of premia on performance increasing over time (Sirower, 1997).

One possible explanation for the lack of replication of previous findings may lie in the event study design. Event studies of firm stock performance may confound the effect of the event in question with other events occurring contemporaneously (Brown & Warner, 1980; 1985). This effect is more likely as the time window in which performance is observed increases (Magenheim & Mueller, 1988). However, the potential for this effect should lessen as sample size increases. Further, both Sirower (1997) and Hayward and Hambrick (1997) used an event study design with similar sample sizes ($n = 168$ and $n = 94$ respectively).

The evidence from the current sample shows that acquiring firms over-estimate the value they were able to extract from a target, but that the size of that error was not systematically related to the size of the premium offered.

Although the results did not support the argument that the greater the acquisition premium the worse the performance, they did show that acquisitions were detrimental to performance in general. The findings are consistent with and support the hubris hypothesis (Roll, 1986). Roll argued that the poor performance observed in acquisitions resulted from managers' over-estimating the value they could earn due to an excessive self-confidence. This research has supported this general proposition and extended it by examining why, and hence when, they are prone to error.

The failure to reject the null Hypotheses 7a – 7c, along with the finding of support for Hypothesis 6, suggests that the estimates of value implicit in the bid price and acquisition premia are, on average, over-stated. However, as stated above, the size of the error appeared to be independent of the size of the premium. That is, there are some real benefits to acquisitions although they are often over-estimated. Examination of Models 10 to 13 support this. In these models the level of relatedness was positively and significantly related to 12 month and 24 month abnormal returns. This suggests that product market relatedness, a source of synergy, led to improved performance in acquiring firms. Thus, synergy appears to be a source of value in acquisitions. However, the analysis in Section 5.3 indicates that relatedness is not significantly related to the size of acquisition premia. Managers did not appear to base estimates of value on the level of common products markets, yet those acquisitions in which acquiror and targets have a higher proportion of common markets showed higher abnormal returns.

A second interesting finding in Models 8 to 13 is that the acquiror's current ratio was negatively related to abnormal returns. This may be due to a form of regression to the mean. High levels of current liquidity likely arise due to past positive performance. In an efficient market one may anticipate such performance to be unsustainable, and hence over time performance should regress to normal levels. As abnormal returns compare future returns with past returns, earning normal profits will represent negative abnormal returns for firms who had earned above normal profits in the period in which the model parameters were estimated.

The data provided no support for inefficient prior management as a source of value in acquisitions. Although Models 1 and 2 indicate that poor prior performance increases the size of acquisition premia (that is, managers view inefficient management as a source of value), there is no evidence it was a source of actual value in the two years following acquisition. In fact, it was negatively related to abnormal returns in the 12 and 24 month periods subsequent to announcement. This is consistent with the findings of Ravenscraft and Scherer (1987) that poor current management may be a motivation for acquisition but the performance of poorly performing lines of business does not improve after acquisition.

In the previous chapters I have argued that acquisition premia are an estimate of the future value of a target firm's assets beyond the value currently being earned and as such comprise the true value (which is knowable only in retrospect) and an error term. I have also proposed that these estimates are likely to be subject to biases that result from the cognitive processes of managers making them. In particular, I argued that the illusion of control will lead managers to base estimates of value on their perceived competence, and hence produce systematically over-confident estimates. The results reported in this chapter provided some support for this argument. Prior performance and expertise are significantly and positively related to the size of acquisition premia and average abnormal returns to acquiring firms are significantly negative. I also hypothesized that managers were more likely to exhibit cognitive biases in forecasts under conditions of high uncertainty. The analyses also supported this argument. To further develop these arguments, if managers' estimates based on perceived competence are biased towards over-confidence, then that bias should be greater when uncertainty is higher. The finding that technological uncertainty is positively related to the size of acquisition premium supports this argument. However, it also implies the error term in the estimate should also be greater under conditions of increased uncertainty. To test this extension of the arguments offered in Chapter 3, post hoc analysis of the abnormal returns earned by firms under different levels of uncertainty was performed.

One-way analysis of variance of mean abnormal returns grouped by a median split of the two uncertainty measures was performed and the results presented in Tables 5.11 and 5.12.

| Technological Uncertainty | 11-day CAR | 12-month CAR | 24-month CAR |
|---|---|---|---|
| Low | -1.49% | -0.00% | 5.74% |
| High | -2.78% | -11.06% | -23.00% |
| F | 1.124 | 3.285* | 10.284*** |

N = 135, * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table 5.11: ANOVA - Mean Abnormal Returns To Acquiring Firms by Level of Technological Uncertainty

This analysis shows that abnormal returns were lower when target firms were in more unpredictable industries. This difference was significant for 12 and 24 month returns when the uncertainty is technologically based. This means that the error in valuations was greater when uncertainty was higher. This, coupled with the previous findings that acquisition premia were higher when technological uncertainty is higher and that premia were, in part, based on estimates of perceived competence, implies that biases in cognitive processes have performance implications for acquiring organizations.

| Commercial Uncertainty | 11-day CAR | 12-month CAR | 24-month CAR |
|---|---|---|---|
| Low | -1.57% | -1.30% | -6.18% |
| High | -2.77% | -10.34% | -10.62% |
| F | 0.951 | 2.197 | 0.226 |

N = 135, * p<0.10, ** p<0.05, *** p<0.01

Table 5.12: ANOVA - Mean Abnormal Returns To Acquiring Firms by Commercial Uncertainty

### *5.6 Summary of Findings*

- The size of acquisition premia in the acquisition announcements in the current sample were related to the expertise of the acquiring CEO in the target industry (supporting Hypothesis 2) and the prior performance of the acquiring firm (supporting Hypothesis 3) but not to the pay of the acquiring CEO relative to other executives in the acquiring firm (not supporting Hypothesis 1).
- The level of technological uncertainty in the target industry was negatively related to the size of acquisition premia offered. The level of commercial predictability in the target industry was not significantly related to the size of premia offered (partially supporting Hypothesis 4).
- The relationship between the acquiring firm's prior performance and CEO expertise persisted in high uncertainty target industries, but not in low uncertainty target

industries. The effect of the relative pay of the CEO was not moderated by the level of uncertainty (predominantly supporting Hypotheses 5a and 5b).

- The cumulative abnormal returns for acquiring firms were negative on average and significantly below 0 for immediate, 1-year and 2-year periods following announcement of the acquisition (supporting Hypotheses 6a, 6b and 6c).
- The size of acquisition premium offered was not significantly related to subsequent abnormal returns in acquiring firms (not supporting Hypotheses 7a, 7b and 7c).

# CHAPTER 6: CONTRIBUTION AND IMPLICATIONS

The general motivation for this dissertation was to investigate factors that may influence acquisition valuations and the effect this may have on organizational performance. To summarize briefly the findings, the sample analyzed in this dissertation was consistent with prior research in showing that managers' individual judgements of the value of targets were frequently considerably higher than those of the market. Three primary factors that influenced the size of these premia were the prior performance of the acquiring firm, the acquiring firm CEO's target industry expertise and the predictability of the target firm's primary industry. The better the acquiror's previous performance (as distinct from their liquidity) the larger the premium paid. Similarly, managers bid higher premia for firms in more unpredictable environments and in industries in which their experience was relevant to major sources of uncertainty. The level of unpredictability moderated the effect of prior performance and expertise on premium bid, in that these factors had little effect on premia when predictability was high.

In this chapter I discuss the theoretical and empirical contributions and implications of this research for existing literature. The next section addresses the implications of this research for the study of acquisition as a strategic action. I then discuss the implications of this work for the study of strategic management in general. The practical implications of the findings for organizations undertaking acquisitions are then developed. The chapter concludes with a discussion of the limitations of the research and directions for future research.

### *6.1 Contribution*

The primary purpose of this dissertation was to examine the acquisition pricing decision and its relationship to post-acquisition performance. Considerable empirical evidence that acquisition strategies are often value destroying has been reported in the literature (e.g. Agrawal et al., 1992; Bradley et al., 1988; Dodd & Ruback, 1977). Building from the work of scholars such as Roll (1986, 1988) and Barney (1988) I focused on the role of the target valuation process as reflected in acquisition premia. Traditional treatments of acquisition premia have focused on the economic factors that are used to calculate value. However, there is emerging evidence that this calculation is influenced by institutional (Haunschild, 1994), social and psychological factors (Hayward & Hambrick, 1997).

Roll's (1986) hubris hypothesis focuses on individual factors. The major assumption of this hypothesis is that markets are efficient and that market prices incorporate all future earning potential. Therefore all bids represent over-payment and only over-confident managers will make a bid. Roll has been criticized for his reliance on this assumption and the assumption that price directly reflects a manager's self-confidence (Sirower, 1997). As such the hubris hypothesis is not able to explain why the same acquiror may make several acquisitions involving different premia, nor why average premia have been increasing since the 1960s. However, the primary insight of the hubris hypothesis, namely that price paid does not necessarily equal value, may be extended to a modified form; the estimates of value are over-optimistic, not the individual manager. The major theoretical contribution of this dissertation is to make this extension and focus on why valuations may be systematically overstated. I have focused on how judgement processes may influence valuation. Behavioural decision research has developed an empirically grounded theoretical framework of how judgement processes may systematically bias forecasting behaviour. I have applied some of this framework to the acquisition valuation task and in doing so provided a theoretical underpinning for understanding the over-valuations frequently observed in acquisitions. Specifically, Roll (1986) has proposed that confidence will be related to valuations and empirical evidence appears to support this (Hayward & Hambrick, 1997). I contributed to this stream of research by providing a theoretical argument for why confidence will influence valuations and thereby address when distortions will arise. The evidence offered in this research was supportive of this framework. Further implications of this framework are discussed in Section 6.2.

This dissertation also makes several empirical contributions. First, I add to the considerable body of research showing that, on average, acquisitions lead to negative returns for acquirors in both the short- and medium-term (e.g. Agrawal et al., 1992; Bradley et al., 1988; Byrd & Hickman, 1992; Dodd & Ruback, 1977; Fowler & Schmidt, 1988; Jennings & Mazzeo, 1991; Sirower, 1997). Further, the majority of acquisitions in the current sample led to an immediate loss of wealth for acquiring firm shareholders on announcement. Second, the data highlights factors that influence acquisition valuations. Consistent with prior literature, poor target performance was positively related to the value managers estimate may be extracted from a target, but was not positively related to the actual value extracted. Level of relatedness did not influence the price bid but was positively related to abnormal returns in the 2 year period after announcement.

Of primary interest is the finding that psychological factors are related to price bid. This shows that the results of Stahl and Zimmerer (1984) and Hitt and Tyler (1991), that target valuations in experimental tasks were based on more than economic factors, may be generalized to actual acquisition valuations. This is important in showing that these effects persist under the informational and incentive structure of the capital market. The study supported and extended Hayward and Hambrick's (1997) findings that measures of perceived competence (prior performance and target industry expertise) were positively related to target valuations and suggests this occurred because of the forecasting process managers use. This research also demonstrated that valuation behaviour is moderated by the level of uncertainty faced in the forecasting task.

To summarize the findings in such a way as to address the research questions raised in Chapter 1, managers over-valued targets because of the nature of the valuation task. As valuation is essentially a forecasting task, managers were susceptible to a tendency to produce overly optimistic estimates. It was argued this resulted from a belief in their ability to alter outcomes and from cognitive processing biases that led forecasts to be based on factors related to perceived competence. These biases were exacerbated by increasing uncertainty. In the case of technological uncertainty, this led to higher premia as the predictability of future outcomes decreased. Managerial characteristics that influenced bids were prior performance and target industry expertise. In the following sections I discuss the implications of these findings.

### *6.2 Implications for the study of acquisition strategies*

Several researchers have proposed that the poor performance often associated with acquisitions may be attributed to over-payment by the acquiring firm (Barney, 1988; Roll, 1986, 1988; Sirower, 1997). However, less research has focused on why acquiring firms systematically over-estimate the value they can extract from the target firm and hence over-pay. In this research I have attempted to build from the underlying logic of Roll's

(1986) hubris hypothesis and the findings of Haywood and Hambrick (1997) to address this issue.

In seeking to explain poor post-acquisition performance I focused on why managers may systematically over-estimate the value in a target. Rather than attribute this to the market selection of over-confident bids, I assumed that valuations represent the acquiring company's best estimate of the value that can be created with the acquisition. However, in some circumstances, specifically under high uncertainty, those company estimates will be based on the judgements of senior executives. In making those judgements executives will rely on decision heuristics, including looking to external institutional (Haunschild, 1994) or industry (Spender, 1987) cues.

In this dissertation I have chosen to focus on how a specific forecasting bias, the over-confidence effect, will influence valuations and hence acquisition premia. However, the foundation of the arguments developed herein is that valuations, as reflected in price bid, are the outcome of a valuation process and as such may be influenced by that process. Therefore, the study of acquisition premia may be profitably directed to other aspects of this process. For example, Haleblian and Leblebici (1997) examine the learning effects of prior acquisition experience on performance, and, specifically, how inappropriate generalization from prior experience may harm post-acquisition performance. Similarly, Haunschild's (1994) work examines the impact of institutional forces in shaping pricing decisions. Other areas with important implications for valuations include group decision making processes, information asymmetries and attitudes towards risk. For example, Kahneman and Tversky's (1979) prospect theory may provide insights into acquisition behaviour under conditions of gain or loss.

A second implication of this approach, supported by the findings, is that valuations are influenced by the interaction between personal characteristics and environmental factors. This is important because, as it currently stands, the hubris hypothesis cannot explain why the same company may make several acquisitions and pay different premia. The explanation for acquisition premia I have offered can be used to make two predictions in this respect. First, perceived competence is task specific, as expertise depends on the target industry characteristics. Second, managers will rely on factors such as perceived competence differently depending on the uncertainty faced.

One interesting effect these results may help explain is the declining performance in acquisitions observed in the last four decades. Recall from Chapter 2 that Jarrell et al. (1988) and Bradley et al. (1988) both observed declining average returns to acquiring firms from the 1960's to the 1980's. Sirower (1997) cited this phenomena to dispute the hubris hypothesis, arguing that the increase in acquisition premia and resultant diminishing returns over the last thirty years would require a corresponding increase in managerial arrogance. It is possible that the decreasing returns result not from increased arrogance but from greater unpredictability in target industries. As the results of this research show, greater uncertainty may lead to higher acquisition premia.

The findings of this research have an interesting implication for the study of related versus unrelated acquisitions. The extent to which relatedness influences the success of acquisitions is unclear in the literature. Some researchers have found the acquisition of related firms to be positively related to post-acquisition performance (e.g. Rumelt, 1974; You, Caves, Henry & Smith, 1986), whereas other researchers have found no significant effect (e.g. Lubatkin, 1987). In this study a measure of the ratio of common product market presence to distinct market presence is significantly and positively related to return in the 12 and 24 month period, but is not significantly related to immediate returns. This suggests that acquiring firms are better able to extract value from targets with whom they have common markets. However, the level of common product market presence is not related to the premium an acquiring firm will offer (see Table 5.3).

This finding may be better understood by considering the nature of relatedness. Prahalad and Bettis (1986) propose that relatedness may be measured by looking to the strategies of the firms rather than to their respective product markets. The authors develop a dominant logic construct to better understand the strategic relatedness. A dominant logic is the background of assumptions, knowledge and heuristics that are important to the successful management of a firm. It is both the knowledge structure and the problem solving processes that are used in strategic decision making. These structures and process are acquired by managers through the course of their career. As Prahalad and Bettis (1986: p.499) state "relatedness may be as much a cognitive concept as it is an economic and technical concept." Attempts to operationalize management logic have focused on the control systems used to coordinate functions (Grant, 1988) or resource allocation decisions (Harrison, Hall & Nargundkar, 1993). These studies have used managerial responses to uncertainty as a measure of relatedness. However, one may argue that the type and source of uncertainty faced are linked to the development of knowledge and heuristics necessary for management. Therefore, a management logic may be similar to the expertise construct in the current study. The results of the study show that expertise increases the size of acquisition premia. Hence, a cognitive form of relatedness may have detrimental effects on acquisition performance.

### *6.3 Implications for the study of strategic management*

A commonly debated issue in the field of organizational strategy is the extent to which managerial discretion influences organizational action (Astley & Van de Ven, 1983; Hambrick & Finkelstein, 1987; Hrebiniak & Joyce, 1985). This dissertation takes a strategic choice approach in assuming that organizations can only act through the imperfect agency of its members. Therefore, managers do matter to organizational strategy. The study provides evidence that individual managers do influence important strategic decisions. The data show that an individual characteristic (expertise) and individual judgement processes (the relative importance of criteria) influence acquisition pricing behaviour. This has important implications for the study of strategic management and competitive advantage, especially in light of Amit and Schoemaker's (1993) observation of the importance of strategic judgement as a source of competitive advantage. In the resource based view of the firm, managerial judgement is path dependent: it is inimitable, valuable and unique, and therefore an important source of superior performance.

The field has been moving towards the study of process issues as "both theoretical and empirical research into the sources of advantage has begun to point to organizational capabilities, rather than product market positions or tactics, as the enduring source of advantage" (Rumelt, Schendel & Teece, 1991: p.22). One critical organizational capability is strategic decision making (Eisenhardt & Zbaracki, 1993). These findings suggest that decision processes warrant further investigation.

The findings of this study also have important implications for a specific research stream in the strategic management field, namely the work on managerial cognition. This research attempts to link managerial information processing with organizational performance (Walsh, 1995). Simon (1957: p.199) observed that "the first consequence of the principle of bounded rationality is that the intended rationality of an actor requires him (sic) to construct a simplified model of the real situation in order to deal with it. He behaves rationally with respect to this model, and such behavior is not even approximately rational with respect to the real world." Following from this observation the managerial cognition literature has focused on the composition of these mental models, to the extent that they are considered the defining feature of the field (Walsh, 1995). As such, the performance implications of knowledge depend upon the match between an individual's model of the environment and the true nature of the environment. This notion of veridicality, or the extent to which knowledge reflects the true state of nature (Hogarth, 1981), is the critical explanatory variable in both cybernetic theories (Ashby, 1958; Walsh, Henderson & Deighton, 1988) and interpretive approaches such as strategic issue diagnosis (e.g. Dutton, Fahey & Narayanan, 1983; Dutton & Jackson, 1987; Dutton, Walton & Abrahamson, 1989).

Existing research focuses on the content and structure of a specific knowledge structure in a given environment. This approach assumes that the closer the model gets to 'reality,' the better the decision maker's performance. However, this assumption is inconsistent with the evidence from studies of expert performance which indicates a process-performance paradox in which experts display superior problem solving behaviour in terms of information selection but do not perform better (Spence & Brucks, 1997). This effect has been noted in tasks closely related to strategic decision making, and especially acquisition valuation (Staël von Holstein, 1972; Yates et al., 1991; although see Johnson, 1988 for an alternative view). Therefore, rather than studying veridicality, more progress may be achieved by focusing on the link between knowledge and behaviour (Walsh, 1995).

Cognitive researchers in management are focused on the content on knowledge and do not pay enough attention to the processes of experts (Stubbart, 1989). This has resulted in a body of literature that is largely descriptive and lacks predictive theory (Walsh, 1995). Future research should be focused on examining what knowledge allows managers to do better, or in some cases worse. To do so, it must address how knowledge may be linked to performance in a particular task. This focuses research on the interaction between processes and environment. For example, this study suggested how knowledge may influence confidence and that confidence may influence judgements in certain task conditions.

Stubbart (1989) suggests that, by focusing on knowledge structures, researchers have 'swung the pendulum' too far away from the study of decision processes. In doing so, an important element of decision making under uncertainty, namely heuristics and biases, have been neglected. Early conceptual work noted their importance in strategy formulation (e.g. Barnes, 1984; Duhaime & Schwenk, 1985; Schwenk, 1984) but this work has not been extensively developed. Acquisitions are an ideal arena for testing the impact of decision biases because of the nature of the task and the ability to judge decision performance through organizational returns. Future research may profitably examine heuristics and biases further.

### *6.4 Implications for practicing managers*

In this dissertation I have argued that cognitive simplification in the pre-acquisition decision processes may have detrimental effects on post-acquisition performance. This argument has important implications for managers seeking to maximize value from acquisition strategies.

First, managers should recognize the importance of pre-acquisition processes on outcomes. Much of the current literature on maximizing acquisition returns focuses on post-acquisition factors such as effective integration of legacy firms and the retention of key personnel (e.g. Datta, 1991; Walsh & Ellwood, 1991). Some researchers such as Jemison and Sitkin (1986) have argued that pre-acquisition activities are vital to the success of the merger; however, such work is in the minority.

Second, Kahneman and Lovello (1993) argue that overly optimistic forecasts occur when managers neglect base rates. This appears especially relevant in acquisition decisions. Empirical evidence is clear in showing that the majority of acquisitions do not create the value anticipated by the acquiring firm, and have not done for the last three decades. To extend Kahneman and Lovello's (1993) advice, companies would be better served by basing estimates of future value on the historical distribution of value created in similar acquisitions in the past and not basing valuations on inherently unknowable future synergies.

Third, Dawes (1988) suggests that the dangers of scenario thinking arise from a lack of consideration of the multiplicative nature of the probability of compound events. This can lead to over-estimations of the likelihood of these events. To counter such biases in strategic planning it has been suggested that managers consider failure scenarios in a form of 'devil's advocacy' (Schwenk, 1988). In doing so, the chain of events required to achieve desired outcomes is explicitly considered, as are the events that may thwart these outcomes, and should thereby ameliorate the illusion of control.

Fourth, managers must be more explicit in considering the source of value incorporated into pricing decisions. In many cases potential synergies are already discounted into the market price.

Finally, it is interesting to note that there is a stronger relationship between managerial factors and premia offered in more uncertain industries, yet ironically it is in these industries that one would intuitively expect they are least likely to be related. This suggests that managers must objectively consider the level of uncertainty they face and the extent of their control over outcomes.

### *6.5 Limitations of the research*

This dissertation was based on an archival study of acquisition behaviour. This was necessary for several reasons. First, it was important to establish a link between acquisition behaviour and organizational outcomes, which could only be achieved by looking at actual acquisition announcements. Second, errors of recall and hindsight bias would taint the data obtained from interviews with managers about past acquisitions. Experimental tasks could not be designed due to the difficulty in recreating the informational, motivational, market and social context in which these judgements are made. The archival method was deemed the most appropriate for the task at hand. However, the design does have some limitations.

First, the cross-sectional nature of the research design used to examine the determinants of acquisition premia limits the extent to which one can validate the hypotheses. In particular, the valuation processes must be inferred from static correlations and, therefore, inferences about causality must be limited. However, this design allowed large scale testing of the general hypotheses. Further more detailed examination of processes would appear to be an area for future research.

Second, the findings reported in this study were based on a sample of publicly traded firms announcing large acquisitions. This resulted in the exclusion of the vast majority of mergers and acquisitions from the sample. Recall from Chapter 1 that in 1997 alone over 11,000 mergers and acquisitions were announced in the United States. It was necessary to limit the sample to ensure that comprehensive and accurate information about the announcements was available. In addition, the current sample was consistent with existing research in the literature and readily comparable to previous findings. However, as a result, one must be cautious about generalizing the findings to other populations, in particular small acquisitions and those involving private firms. Nevertheless, the current sample was one where managers are closely monitored and where economic factors could be expected to play a dominant role in determining acquisition behaviour, and so provided a relatively conservative test of the hypotheses.

Third, the use of archival data precluded the measurement of subjective data. For example, studies of environmental uncertainty usually make a distinction between objective and subjective uncertainty (Boyd, Dess & Rasheed, 1993). In the current study a measure of variation in objective industry characteristics was used. However, it is to a subjective notion of perceived uncertainty that managers must respond. This subjective uncertainty is based on individual managers' reactions to objective factors. The discrepancy between these two was minimized by using predictability, a component of objective uncertainty that has been shown to be closely related to the perception of uncertainty (Wholey & Brittain, 1989).

### *6.6. Areas for future research*

The discussion of the implications and limitations of the current study suggest several areas for future research.

First, it would be valuable to test the generalizability of these finding to other samples. As noted above, the majority of mergers and acquisition involve privately owned or small firms. It would be beneficial to establish the extent to which over-valuation occurs when agency concerns are less prominent in privately owned firms, or when firms do not have the resources to absorb poor performance as may be the case in smaller companies.

Second, the arguments offered in this dissertation are portable to other large non-routine organizational decisions. Acquisitions provide an ideal context for the study of decision biases in strategy formulation because of the direct link between valuations, price offered and performance. One may anticipate similar effects in other large resource investment decisions such as research and development project funding or product launches.

Finally, an intriguing direction for research suggested by the findings is to explore the non-process related effects of knowledge or expertise. In this study, expertise leads to higher valuations of targets because it increases the amount of value managers estimate can be extracted. An example of other potential research in this direction is to explore how knowledge may impact perceived uncertainty, and may therefore affect decision behaviour. As knowledge is used to interpret information and provide default values for missing data (Fiske & Taylor, 1991), the level and type of knowledge will impact perceived uncertainty arising from missing information.

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# APPENDIX A

## Acquisition Announcements Sampled

| Date of Announcement | Acquiror | Acquiror's Primary Industry | Target | Target's Primary Industry | Price (US$m) |
|---|---|---|---|---|---|
| 18-Jan-94 | First Union Corp | 6162 | Bancflorida Financial Corp | 6140 | 168.00 |
| 20-Jan-94 | Keystone Financial Inc | 6022 | Frankford Corp Pa | 6020 | 127.80 |
| 31-Jan-94 | Bankamerica Corp | 6021 | Continental Bank Corp | 6020 | 1980.00 |
| 16-Feb-94 | United Healthcare Corp | 6324 | Ramsay H M O Inc | 8099 | 567.90 |
| 08-Mar-94 | Corestates Financial Corp | 6021 | Germantown Savings Bank | 6036 | 260.00 |
| 16-Mar-94 | Adobe Systems Inc | 7371 | Aldus Corp | 7372 | 410.60 |
| 25-Mar-94 | K N Energy Inc | 4923 | American Oil & Gas Corp | 4922 | 302.00 |
| 02-May-94 | Conseco Inc | 6311 | Statesman Group Inc | 6310 | 334.00 |
| 10-May-94 | Fleet Financial Group Inc New | 6021 | N B B Bancorp Inc | 6020 | 420.00 |
| 12-May-94 | First Union Corp | 6162 | American Savings Of Florid | 6035 | 253.00 |
| 24-May-94 | Columbia HCA Healthcare Corp | 8062 | Medical Care America Inc | 8082 | 858.40 |
| 24-May-94 | Dresser Industries Inc | 3533 | Wheatley T X T Corp | 3561 | 194.40 |
| 02-Jun-94 | Corning Inc | 3229 | Nichols Institute | 8071 | 222.00 |
| 10-Jun-94 | Read Rite Corporation | 3679 | Sunward Technologies Inc N | 3679 | 154.00 |
| 14-Jun-94 | Noble Drilling Corp | 1381 | Chiles Offshore Corp | 1381 | 207.20 |
| 20-Jun-94 | Omega Healthcare Investors Inc | 6162 | Health Equity Properties I | 6798 | 143.30 |
| 27-Jun-94 | North Fork Bancorporation NY Inc | 6022 | Metro Bancshares | 6020 | 126.40 |
| 01-Jul-94 | Burlington Northern Santa Fe Cp | 4011 | Santa Fe Pac Corp | 4011 | 3850.00 |
| 01-Jul-94 | New York Bancorp Inc | 6020 | Hamilton Bancorp Inc | 6030 | 128.10 |
| 05-Jul-94 | Benson Eyecare Corp | 5048 | Optical Radiation Corp | 3851 | 143.00 |
| 15-Jul-94 | Tyco International Ltd | 3317 | Kendall International Inc | 3842 | 1400.00 |
| 03-Aug-94 | American Home Products Corp | 2834 | American Cyanamid Co | 2833 | 9228.30 |
| 04-Aug-94 | Chase Manhattan Corp | 6021 | American Residential Hdgs | 6162 | 348.00 |
| 16-Aug-94 | Sensormatic Electronics Corp | 3825 | Knogo Corp | 3669 | 100.00 |
| 19-Aug-94 | Harnischfeger Industries Inc | 3532 | Joy Technologies Inc | 3532 | 391.00 |
| 22-Aug-94 | Firstar Corp New | 6022 | Investors Bank Corp | 6035 | 106.00 |
| 23-Aug-94 | Johnson & Johnson | 3842 | Neutrogena Corp | 2841 | 924.10 |
| 30-Aug-94 | Ivax Corp | 2834 | Zenith Laboratories Inc | 2834 | 593.70 |
| 07-Sep-94 | Fleet Financial Group Inc New | 6021 | Plaza Home Mortgage Corp | 6162 | 120.00 |
| 09-Sep-94 | Raytheon Co | 3812 | Xyplex Inc | 3577 | 171.00 |
| 16-Sep-94 | Torchmark Corp | 6311 | American Income Holding In | 6311 | 550.80 |
| 21-Sep-94 | Lilly Eli & Co | 2834 | Mckesson Corp | 5122 | 3240.70 |
| 22-Sep-94 | Arrow Electronics Inc | 5065 | Anthem Electronics Inc | 3674 | 390.60 |
| 27-Sep-94 | Bankamerica Corp | 6021 | Arbor National Holdings In | 6160 | 118.00 |
| 27-Sep-94 | Barnett Banks Inc | 6021 | Equicredit Corp | 6141 | 332.00 |
| 28-Sep-94 | American International Group Inc | 6311 | 20th Century Industries | 6310 | 400.00 |
| 04-Oct-94 | Humana Inc | 8062 | Carenetwork Inc | 8099 | 123.00 |
| 05-Oct-94 | Columbia HCA Healthcare Corp | 8062 | Healthtrust Inc Hospital C | 8062 | 3493.20 |
| 14-Oct-94 | Microsoft Corp | 7372 | Intuit Inc | 7372 | 1500.00 |

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|---|---|---|---|---|---|
| 26-Oct-94 | Avid Technology Inc | 5065 | Digidesign Inc | 7373 | 205.00 |
| 31-Oct-94 | Pfizer Inc | 2834 | Namic U S A Corp | 3841 | 156.80 |
| 03-Nov-94 | Quaker Oats Co | 2032 | Snapple Beverage Corp | 2086 | 1700.00 |
| 08-Nov-94 | C C B Financial Corp | 6021 | Security Capital Bancorp | 6020 | 214.30 |
| 09-Nov-94 | Boston Scientific Corp | 3841 | Sci Med Life Systems Inc | 3841 | 865.00 |
| 09-Nov-94 | Stant Corp | 3714 | Trico Products Corp | 3714 | 160.00 |
| 14-Nov-94 | Phillips Van Heusen Corp | 2321 | Crystal Brands Inc | 2329 | 120.00 |
| 15-Nov-94 | Sybase Inc | 7372 | Powersoft Corp | 7372 | 904.00 |
| 29-Nov-94 | U S A Waste Services Inc | 4953 | Chambers Development Inc | 4953 | 347.50 |
| 05-Dec-94 | Amgen Inc | 5122 | Synergen Inc | 8731 | 262.00 |
| 07-Dec-94 | Loews Corp | 6311 | Continental Corp | 6410 | 1100.00 |
| 13-Dec-94 | Bisys Group Inc | 7374 | Concord Holding Corp | 6282 | 120.00 |
| 13-Dec-94 | Williams Cos | 4922 | Transco Energy Co | 4920 | 1010.00 |
| 20-Dec-94 | I T T Corp Nev | 6331 | Caesars World Inc | 7011 | 1700.00 |
| 28-Dec-94 | Beverly Enterprises | 8051 | Pharmacy Management Service | 6324 | 148.50 |
| 28-Dec-94 | Rite Aid Corp | 5912 | Perry Drug Stores Inc | 5912 | 132.00 |
| 4-Jan-95 | First Union Corp | 6162 | Coral Gables Fedcorp Inc | 6035 | 531.00 |
| 4-Jan-95 | United Healthcare Corp | 6324 | Gencare Health Systems Inc | 8011 | 520.00 |
| 5-Jan-95 | Johnson & Johnson | 3842 | Mitek Surgical Products In | 3842 | 128.00 |
| 5-Jan-95 | Minnesota Power & Light Co | 4911 | A D E S A Corp | 5012 | 167.00 |
| 27-Jan-95 | Valley National Bancorp | 6021 | Lakeland First Financial G | 6020 | 120.20 |
| 6-Feb-95 | National Australia Bk Ltd | 6020 | Michigan National Corp | 6021 | 1560.00 |
| 15-Feb-95 | Fritz Companies Inc | 4731 | Intertrans Corp | 4731 | 210.00 |
| 22-Feb-95 | First Union Corp | 6162 | United Financial Corp Of S | 6020 | 132.00 |
| 8-Mar-95 | Platinum Technology Inc | 7372 | Trinzic Corp | 7371 | 151.90 |
| 20-Mar-95 | Keycorp New | 6021 | Autofinance Group Inc | 6141 | 304.90 |
| 29-Mar-95 | Ingersoll Rand Co | 3561 | Clark Equipment Co | 3531 | 1500.00 |
| 31-Mar-95 | Sun Healthcare Group Inc | 8051 | Careerstaff Unlimited Inc | 8049 | 107.20 |
| 31-Mar-95 | Watson Pharmaceuticals Inc | 2834 | Circa Pharmaceuticals Inc | 2834 | 466.00 |
| 3-Apr-95 | Raytheon Co | 3812 | E Systems Inc | 3661 | 2214.70 |
| 5-Apr-95 | Barrett Resources Corp | 1311 | Plains Petroleum Co | 1311 | 296.00 |
| 5-Apr-95 | F M C Corp | 2819 | Moorco International Inc | 3824 | 310.80 |
| 7-Apr-95 | First Union Corp | 6162 | Columbia First Bk A Fsb Wa | 6035 | 222.00 |
| 11-Apr-95 | Frontier Corp | 4813 | A L C Communications Corp | 4813 | 1570.00 |
| 25-Apr-95 | Circon Corp | 3841 | Cabot Medical Corp | 3841 | 105.00 |
| 28-Apr-95 | Crestar Financial Corp | 6022 | Loyola Capital Corp | 6035 | 259.20 |
| 4-May-95 | Grancare Inc | 8059 | Evergreen Healthcare Inc | 8051 | 162.00 |
| 9-May-95 | United Dominion Industries Ltd | 3441 | Flair Corp | 3564 | 125.60 |
| 16-May-95 | Norwest Corp | 6021 | Foothill Group Inc | 6153 | 530.00 |
| 22-May-95 | Banctec Inc | 3577 | Recognition International | 3577 | 180.00 |
| 23-May-95 | M C I Communications Corp | 4899 | Nationwide Cellular Service | 4812 | 190.00 |
| 25-May-95 | Bard C R Inc | 3845 | Medchem Products Inc | 2819 | 102.00 |
| 26-May-95 | Computer Associates Intl Inc | 7372 | Legent Corp | 7372 | 1845.30 |
| 31-May-95 | First Union Corp | 6162 | R S Financial Corp | 6020 | 111.60 |
| 5-Jun-95 | International Business Machs Cor | 3577 | Lotus Development Corp | 7372 | 3520.00 |
| 14-Jun-95 | First Data Corp | 7374 | First Financial Management | 7374 | 6600.00 |

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|---|---|---|---|---|---|
| 19-Jun-95 | First Union Corp | 6162 | First Fidelity Bancorp New | 6020 | 5400.00 |
| 21-Jun-95 | Union Planters Corp | 6021 | Capital Bancorporation Inc | 6020 | 133.00 |
| 23-Jun-95 | Adobe Systems Inc | 7371 | Frame Technology Corp | 7373 | 460.00 |
| 27-Jun-95 | Richfood Holdings Inc | 5141 | Super Rite Corp | 5141 | 253.00 |
| 6-Jul-95 | Nationsbank Corp | 6021 | CSF Holdings Inc | 6030 | 516.00 |
| 7-Jul-95 | Grand Casinos Inc | 7011 | Gaming Corp Of America | 7999 | 1333.00 |
| 11-Jul-95 | Danaher Corp | 3714 | Joslyn Corp | 3613 | 245.00 |
| 17-Jul-95 | Kimberly Clark Corp | 2676 | Scott Paper Co | 2676 | 9400.00 |
| 20-Jul-95 | Banc One Corp | 6021 | Premier Bancorp Inc | 6020 | 635.00 |
| 25-Jul-95 | Gannett Inc | 2711 | Multimedia Inc New | 4832 | 1711.00 |
| 25-Jul-95 | Norwest Corp | 6021 | Amfed Financial Inc | 6030 | 182.60 |
| 27-Jul-95 | 3com Corp | 3661 | Chipcom Corp | 3577 | 775.00 |
| 31-Jul-95 | Disney Walt Co | 7812 | Capital Cities ABC Inc | 4833 | 19000.00 |
| 31-Jul-95 | General Electric Co | 3634 | Outlet Communications Inc | 4833 | 320.80 |
| 7-Aug-95 | Mercantile Bancorporation Inc | 6022 | Hawkeye Bancorporation | 6021 | 351.00 |
| 16-Aug-95 | Apple South Inc | 5812 | D F & R Restaurants Inc | 5812 | 208.00 |
| 25-Aug-95 | Ceridian Corp | 7374 | Comdata Holdings Corp | 7389 | 879.90 |
| 25-Aug-95 | Enron Corp | 5171 | Coda Energy Inc | 1311 | 189.90 |
| 28-Aug-95 | Boatmens Bancshares Inc | 6021 | Fourth Financial Corp | 6021 | 12000.00 |
| 29-Aug-95 | Cardinal Health Inc | 5122 | Medicine Shoppe Intl Inc | 6794 | 351.20 |
| 29-Aug-95 | National City Corp | 6021 | Integra Financial Corp | 6020 | 2100.00 |
| 31-Aug-95 | Bell Industries Inc | 5065 | Sterling Electronics Corp | 3699 | 141.00 |
| 31-Aug-95 | Boston Scientific Corp | 3841 | Heart Technology Inc | 3841 | 500.00 |
| 6-Sep-95 | Nationsbank Corp | 6021 | Bank South Corp | 6020 | 1590.00 |
| 6-Sep-95 | Teradyne Inc | 3823 | Megatest Corp | 3559 | 245.00 |
| 14-Sep-95 | Textron Inc | 3728 | Elco Industries Inc | 3452 | 186.00 |
| 25-Sep-95 | Republic New York Corp | 6020 | Brooklyn Bancorp Inc | 6030 | 529.60 |
| 3-Oct-95 | Tracor Inc New | 8742 | A E L Industries Inc | 3813 | 115.00 |
| 10-Oct-95 | Boston Scientific Corp | 3841 | EP Technologies Inc | 3841 | 150.00 |
| 10-Oct-95 | Corestates Financial Corp | 6021 | Meridian Bancorp Inc | 6022 | 3200.00 |
| 10-Oct-95 | Healthsouth Corp | 8093 | Surgical Care Affiliates Inc | 8093 | 1200.00 |
| 11-Oct-95 | Bankboston Corp | 6021 | Boston Bancorp | 6030 | 221.00 |
| 20-Oct-95 | American General Corp | 6162 | Independent Insurance Group | 6311 | 362.00 |
| 20-Oct-95 | Johnson & Johnson | 3842 | Cordis Corp | 3845 | 1800.00 |
| 24-Oct-95 | Proffitts Inc | 5311 | Younkers Inc | 5311 | 207.00 |
| 31-Oct-95 | Bradley Real Estate Inc | 6799 | Tucker Properties Corp | 6798 | 115.00 |
| 1-Nov-95 | Alberto Culver Co | 2844 | St Ives Laboratories Inc | 2844 | 120.00 |
| 1-Nov-95 | Southtrust Corp | 6022 | Bankers First Corp | 6030 | 148.00 |
| 7-Nov-95 | Compaq Computer Corp | 3571 | Networth Inc | 7372 | 372.00 |
| 7-Nov-95 | International Paper Co | 2631 | Federal Paper Board Inc | 2611 | 2700.00 |
| 7-Nov-95 | Sherwin Williams Co | 2851 | Pratt & Lambert United Inc | 2851 | 400.00 |
| 14-Nov-95 | Norwest Corp | 6021 | Victoria Bankshares Inc | 6020 | 278.00 |
| 20-Nov-95 | Tidewater Inc | 4499 | Hornbeck Offshore Services | 4499 | 255.20 |
| 30-Nov-95 | M A F Bancorp Inc | 6020 | N S Bancorp Inc | 6036 | 277.20 |
| 30-Nov-95 | Rite Aid Corp | 5912 | Revco D S Inc New | 5912 | 18000.00 |
| 1-Dec-95 | Broken Hill Proprietary Co Ltd | 1011 | Magma Copper Co | 1021 | 1800.00 |

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|---|---|---|---|---|---|
| 12-Dec-95 | Bankboston Corp | 6021 | Baybanks Inc | 6030 | 2000.00 |
| 19-Dec-95 | Healthsouth Corp | 8093 | Advantage Health Corp | 8069 | 325.00 |
| 19-Dec-95 | Steris Corp | 8742 | Amsco International Inc | 3841 | 508.00 |
| 19-Dec-95 | U S A Waste Services Inc | 4953 | Western Waste Inds | 4953 | 450.00 |